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LANCASHIRE COUNTY COUNCIL

ANNUAL REPORT

of the

COUNTY ANALYST

for

THE YEAR 1955.

PRESTON:
PRINTED BY T. SNAPE & CO., LTD., BOLTON'S COURT.
1956.

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PUBLIC HEALTH AND HOUSING COMMITTEE (1956)

The Chairman of the County Council :

COUNTY ALDERMAN SIR ALFRED BATES, M.C., D.L.

The Vice-Chairman of the County Council :

COUNTY ALDERMAN A. SMITH, C.B.E., J.P.

The Chairman of the Finance Committee :

COUNTY COUNCILLOR R. GUYMER, J.P.

The Chairman of the Health Committee :

COUNTY ALDERMAN H. LORD, M.B.E., J.P.

Chairman of Committee :

COUNTY ALDERMAN SIR THOMAS TOMLINSON, J.P.

Vice-Chairman :

COUNTY ALDERMAN R. H. ROWLANDS.

County Aldermen :

A. Guest, Esq., J.P.
R. S. Schofield, Esq., J.P.
J. W. Thorley, Esq.
William J. Throup, Esq.
Lady Worsley-Taylor, J.P.

County Councillors :

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S. J. Bargh, Esq., J.P.
C. Bethell, Esq.
H. J. Brett, Esq.
G. L. Buckley, Esq., J.P.
Mrs. A. G. Clayton.
W. Clegg, Esq.
G. H. Dearden, Esq.
W. Forrest, Esq.
Mrs. J. Grundy.
Dr. M. K. Hall.
T. G. Harrison, Esq., J.P.
C. G. Mack, Esq., M.B.E., M.INST.T., J.P.
H. P. Minton, Esq.
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Miss F. M. Openshaw, J.P.
T. Sharrock, Esq.
H. A. Slater, Esq., M.B.E., F.S.I.
W. Starkie, Esq.
Fred Taylor, Esq.
J. H. S. Terry, Esq.
T. Ward, Esq., J.P.
R. Webster, Esq.
F. Whitworth, Esq.

LANCASHIRE COUNTY LABORATORY

STAFF 1956.

County Analyst :
G. H. WALKER, PH.D., B.SC., F.R.I.C.

Deputy County Analyst :
A. C. BUSHNELL, F.R.I.C.

Senior Assistant Analyst :
R. ARNOT, B.SC., F.R.I.C.

Second Senior Assistant Analyst :
M. S. GREEN, B.SC., A.R.I.C.

Assistant Analysts :
MISS C. MAYNE, B.SC., A.M.C.T., A.R.I.C.
R. E. BRIDGE, M.SC.
J. L. WILLIAMS.
G. S. MEADOWS, F.R.I.C.
MISS D. SMITHSON, B.SC.
G. W. EARNSHAW.
K. FISHER.

Laboratory Assistants :
MRS. M. PENKETH.
MRS. B. SCOTT.
MISS S. CHESWORTH.

Clerical Staff :
E. L. SIMPSON, T.D., F.C.C.S.
H. HIGGINSON, A.C.C.S.
MISS O. THOMAS.
MISS A. BURNS.

Laboratory Attendant :
MRS. E. HANNAH.

LANCASHIRE COUNTY COUNCIL

ANNUAL REPORT OF THE COUNTY ANALYST FOR THE YEAR 1955.

To the Chairman and Members of the Lancashire County Council.

I have the honour to submit for your consideration my tenth Annual Report which deals with the work carried out in the County Laboratory during the year ended 31st December, 1955. The total number of analyses and tests carried out in this period was 13,355; in order to facilitate reference these have been grouped under the following headings:

Part I. Reports on Samples taken under the Food and Drugs Acts, 1938 to 1950. Page 8.

Part II. Report on Heat-treated Milk Samples taken under the Milk (Special Designation) (Pasteurised and Sterilised Milk) Regulations, 1949 to 1953. Page 90.

Part III. Report on Samples taken under the Fertilisers and Feeding Stuffs Act, 1926. Page 95.

Part IV. Report on Waters, Effluents, etc. Page 103.

Part V. Miscellaneous (including Atmospheric Pollution). Page 105.

The total number of samples from all sources examined during the year is the highest recorded for the laboratory and is over double the number examined annually in any year prior to 1947. The number of samples examined for the County under the Food and Drugs Acts and the Fertilisers and Feeding Stuffs Act (excluding however milk samples submitted for Phosphatase, Methylene Blue or Turbidity Tests) was 8,474 and the number of Food and Drug samples submitted by the ten Autonomous Food and Drugs Authorities, for which your Analyst acts as Public Analyst, was 1,988. The increase in the total number of samples examined during the year 1955 was, in the main, due to (*a*) the appointment, from April, 1955, of your Analyst as Public Analyst for the County

Borough of Southport, and (*b*) the growing number of heat-treated milk samples submitted consequent to the making of further Milk (Special Designations) (Specified Areas) Orders.

The number of Food and Drugs samples submitted by the County Sampling Officers during the year 1955 was 8,373, as against 8,089 during the previous year and 8,635 in the year 1953 ; the rate of samples per 1,000 of the population was 6·13 in the year under review, 5·93 in 1954 and 5·98 in 1953. The rate of samples per 1,000 of the population for 1955 is, in fact, 0·14 per thousand higher than in any previous year.

The number of County Food and Drugs Samples has therefore been maintained well above the level reached in 1947 (6,819). Prior to 1947, the highest figure was 5,263 in the year 1933. During the year the number of samples found to be adulterated or unsatisfactory was 413 ; this corresponds to an adulteration rate of 4·9 per cent., as against 5·1 per cent. in the year 1954, and 4·5 per cent. in the year 1953. Table 4 gives the percentage adulteration for the last 10 years and it will be seen that there has been an appreciable drop in this figure since the year 1945. Viewed in the light of the figures for the last 10 years the adulteration rate for the year, 1955, cannot be regarded as altogether unsatisfactory but it is still higher than in the years immediately preceding the last war when the percentage adulteration varied from 2·6 to 4·2.

In addition to Food and Drugs samples the County Sampling Officers submitted 1,148 samples of heat-treated milk for examination by the Phosphatase test, the half-hour Methylene Blue test or by the Turbidity test as against 867 samples submitted in the previous year. Of these, 10 failed to pass the Phosphatase test and three samples failed to pass the statutory Methylene Blue test, the corresponding figures for the year 1954 being 10 and four. In addition 10 samples of raw milk were submitted for examination by the Phosphatase or Methylene Blue tests. The number of Specified Areas in the County in which only designated milks can be sold is continually increasing due to the making of further Milk (Special Designations) (Specified Areas) Orders, one more of which affecting the County came into operation during the year under review. By the end of 1955, a total of 42 of the 92 County Districts in the County Food and Drugs Area had become Specified Areas. As a result of this policy on the part of the Government, more and more milk sold under special designations will be consumed and it is therefore expected that the number of pasteurised and sterilised milk samples submitted for examination by the statutory tests will also show a tendency to increase. A reference to page 93 of this report will show that as a result of this type of sampling, 14 successful prosecutions were instituted during the year in respect of raw undesignated milk sold in Specified Areas in the County.

As usual some two-thirds of the Food and Drugs samples submitted by the County Sampling Officers consisted of samples of milk. Of 5,637 milk samples 273 were found to be adulterated which represents an adulteration rate of 4·8 per cent. The corresponding figure for the year 1954 was 5·6 per cent. and for the year 1953 it was the same as for the year under review, *i.e.*, 4·8 per cent. Reference to table 9 shows that, in general, milk adulteration in the County of Lancaster has shown consistent and appreciable decreases since the year 1946. It is reasonable to assume that these decreases are in some measure due to the increased sampling which has occurred since that year.

The adulteration rate for samples other than milk was 5·1 per cent. and is 0·7 per cent. higher than that obtained in the year 1954 when the figure was 4·4 per cent. The adulteration rate for the last nine years has varied from 2·8 to 5·1 per cent., the former figure in the year 1950 and the latter in the year 1955. The commodities which showed a relatively high proportion of unsatisfactory samples and, therefore, contributed especially to the adulteration rate included ice-cream, sausages, orange drinks, ammoniated tincture of quinine and samples whose labels did not conform to the requirements of the Labelling of Food Order. An examination, however, of table 24 and the sections of the report concerned with the commodities just mentioned will bring to light the fact that many of the samples reported as unsatisfactory showed only slight irregularities in composition or minor infringements of labelling requirements.

The Food and Drugs Act, 1955, received the Royal Assent in November of the year under review and it came into operation on the 1st January, 1956. This Act consolidates the Food and Drugs Act, 1938, The Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950, and new legislation contained in the Food and Drugs Amendment Act, 1954. Food and Drugs legislation, or more particularly food legislation, is now once again for all practical purposes concentrated under one Act and the year 1955 has seen the end of the period brought about by the war during which this legislation was divided between the Food and Drugs Acts and Ministry of Food Regulations. The Ministry of Food was dissolved in April, 1955, and its remaining functions have now been transferred to the Minister of Agriculture, Fisheries and Food, or to the Minister of Health or to both acting jointly. New Regulations were also made during the year governing the composition of butter and margarine and the labelling of margarine. Chewing gum and similar products are now defined as " food " for the purposes of the Food and Drugs Act and The Mineral Oil in Food Order has, therefore, been amended to permit the sale of chewing gum containing not more than 12·5 per cent. of mineral oil of prescribed quality. The Food Standards (Table Jellies) Order was amended during

the year 1955 to permit the use, under certain conditions, of low setting gelatine in the manufacture of table jelly crystals and a Bread (Amendment) Order was made which permits the sale of " National Milk Bread " at a higher price than " National Bread " provided that a prescribed proportion of skim milk powder is present. Finally, before leaving the subject of new Regulations, mention should be made of the Fertilisers and Feeding Stuffs Regulations, 1955, which replace previous regulations and which are discussed in some detail in Part III of this report.

The Minister of Food and the Minister of Agriculture, Fisheries and Food approved for publication during the year three reports of the Food Standards Committee. Two of these were concerned with colouring matters in food and, broadly speaking, they recommended that the Public Health (Preservatives, etc., in Food) Regulations should be amended to permit the use in foods of certain colouring matters only, instead of, as at present, permitting the use of all colouring matters with the exception of a few prohibited colours. These reports are discussed on page 11. The remaining report is concerned with the limits for traces of arsenic in foods and makes revised recommendations in respect of certain foods; of particular interest will be the more stringent limit of 0·5 part per million now recommended for ice-cream and ice lollies. A 90-page addendum to the British Pharmacopoeia was also published during the year under review. The present Pharmacopoeia came into official use in September, 1953, and it is a pointer to the rate at which our knowledge of drugs is increasing that so soon afterwards it should be considered necessary to publish this addendum.

It will be remembered that in this report for both the years 1953 and 1954 reference was made to the unsatisfactory manner in which some orange drinks sold in one-third pint bottles by dairies were being labelled. Your Committee did, in fact, resolve that this matter be referred to the County Councils Association with a view to representations being made to the Minister for an amendment to the appropriate order. This question is, I believe, still actively under consideration by the Ministry of Agriculture, Fisheries and Food but no alteration to the regulations has yet been made. A reference to the section of this report which deals with soft drinks will show that during the year under review further unsatisfactory samples were obtained and that in one instance legal proceedings were instituted under the Defence (Sale of Food) Regulations; the need for an appropriate amendment to the Regulations, therefore, still remains.

Other points which may be of special interest in the report are the paragraphs dealing with Penicillin Preparations and, in particular, the deterioration which may occur in tablets of penicillin if storage is

inefficient. Reference is made in the section on Calomel and Grey Powder to mercurial teething powders as a cause of Pink Disease in infants. Table 25 in the section dealing with ice-cream illustrates the improvement over the last 10 years in the quality of this commodity sold in the County and shows that the present-day compositional level has been steadily maintained over the last six years. With regard to ice lollies no unsatisfactory samples were submitted by County Sampling Officers during the year but one sample submitted by an Autonomous Food and Drugs Authority contained metallic impurities due to unsuitable moulds being used by the manufacturers. It cannot be too strongly stressed that moulds for the manufacture of ice lollies should be constructed from, and only repaired with, materials of proved suitability for this purpose.

In addition to food and drugs samples and other samples discussed in Parts I to IV of the report, mention is made on pages 105 to 114 of a number of miscellaneous samples which may be of interest. These include investigations in connection with atmospheric pollution, the examination of samples of skimmed milk powder, one of which was found to be of borderline quality, the examination of a sample of honey stated to be home produced but which was found to have been imported, the work carried out on a sample of antibiotic supplement for addition to animal feeding stuffs which proved to be deficient in potency and an investigation into the metallic contamination of vegetables which may occur if they are stored after peeling under water in metallic containers.

It has already been mentioned that the total number of samples examined during the year under review is higher than ever before. While the increase in samples during the year is quite appreciable and amounts to approximately 1,000 additional examinations it represents only one stage in the general increase in work which has occurred since the war and which is brought out in greater detail by the figures given in table 2. This growth in the work of the County Laboratory must necessarily mean added burdens for all members of the staff intensified by the fact that almost all food and drugs legislation in recent years has resulted in new standards, etc., which for their efficient enforcement entail additional and often very intricate work on the part of the analyst. In recording my appreciation of the very loyal support I have had from all members of the staff of the County Laboratory in the carrying out of the work described in this report I feel that this could not have been accomplished without having, at the same time, the valuable help of the County Sampling Officers and the Sampling Officers of the Autonomous Food and Drugs Authorities all of whom have very willingly co-operated to ensure the smooth working of the laboratory.

In conclusion, to the members of the County Council and to the County Medical Officer of Health I wish to express my appreciation of their continued encouragement and support and of the unfailing interest shown in the work of the laboratory.

I have the honour to be, Mr. Chairman, Ladies and Gentlemen,

Your obedient Servant,

GEO. H. WALKER,
County Analyst.

The County Laboratory,
County Hall,
Preston.
24th July, 1956.

Total Samples Examined.

During the year 1955, a total of 13,355 analyses and tests have been carried out in the County Laboratory. They are classified in the following table :—

Table 1.

County Samples—		
Food and Drugs Acts (including 5,637 milks)		8,373
Appeal-to-Cow		49
Fertilisers and Feeding Stuffs Act, 1926		52
Food and Drugs Acts samples (including five Appeal-to-Cow) from the following autonomous Food and Drugs Authorities—		
Borough of Chorley	103	
Borough of Darwen	46	
City of Lancaster	151	
Borough of Leigh	159	
Borough of Middleton	95	
Borough of Morecambe and Heysham	178	
County Borough of Preston	583	
County Borough of Southport	263	
Urban District of Huyton-with-Roby	343	
Urban District of Newton-le-Willows	67	
		1,988
Fertilisers and Feeding Stuffs Act, 1926—		
Preston County Borough		8
Southport County Borough		16
Other Samples (from all sources including the County)—		
Potable Waters		70
Other Waters and Effluents		48
Miscellaneous		288
Milk Samples.—Phosphatase Tests		1,157
Milk Samples.—Methylene Blue Tests		1,155
Milk Samples.—Turbidity Tests		151
Total number examined		13,355

The total number of samples analysed in the year is compared with the total numbers similarly classified for the previous years 1912–1954, in table 2. It will be seen from the table that, since the year 1912, the grand total of samples examined amounts to 268,308.

Table 2.

Total number of Samples examined during the years 1912 to 1955.

Year.	County Food and Drugs.	Other Authorities Food and Drugs.	County Appeal-to-cow Samples.	Other Authorities Appeal-to-cow Samples.	Fertilisers and Feeding Stuffs Act.	Waters and Effluents.	Miscellaneous and Departmental.	Total Phosphatase, Methylene Blue and Turbidity Tests	Total.
1912–1943	148050	1480	2014	30	678	2176	2762	...	157190
1944	1816	540	2	4	28	35	15	...	2440
1945	1731	292	3	16	17	58	8	...	2125
1946	4122	576	107	8	29	51	36	67	4996
1947	**6819**	**962**	**110**	**13**	**34**	**48**	**35**	**1062**	**9083**
1948	**6958**	**783**	**59**	**13**	**31**	**46**	**88**	**1052**	**9030**
1949	**7700**	**1060**	**53**	**10**	**52**	**77**	**98**	**1425**	**10475**
1950	**8104**	**1040**	**38**	**1**	**58**	**113**	**149**	**1595**	**11098**
1951	**8501**	**1337**	**28**	**9**	**54**	**196**	**203**	**1602**	**11930**
1952	**8622**	**1418**	**40**	**12**	**53**	**126**	**208**	**1745**	**12224**
1953	**8635**	**1345**	**50**	**11**	**59**	**112**	**237**	**1797**	**12246**
1954	8089	1612	67	3	62	84	250	1949	12116
1955	8373	1983	49	5	76	118	288	2463	13355
1912–1955	227520	14428	2620	135	1231	3240	4377	14757	268308

PART I.—SAMPLES TAKEN UNDER THE FOOD AND DRUGS ACTS, 1938 TO 1950.

The year under review is particularly important in that in November, 1955, the Food and Drugs Act, 1955, received the Royal Assent and it came into operation on the 1st January, 1956. This Act consolidates and places on a permanent footing those parts of the 1938 Act and other post-war Acts and Regulations which were in operation up to the 1st January, 1956. It may be said, therefore, to bring to an end the period brought about by the war, during which Food and Drugs legislation was sub-divided under a number of Acts and Regulations.

The Acts which the 1955 Act consolidates are the Food and Drugs Act, 1938, the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950, the Food and Drugs Amendment Act, 1954, together with certain other legislation concerning slaughterhouses and knacker's yards. New legislation in the 1955 Act is really derived from the Food and Drugs Amendment Act, 1954, which also came into operation on the 1st January, 1956, but was repealed on the same day and was immediately superseded by the 1955 Act. This new legislation was discussed in some detail in these reports for the years 1953 and 1954 and it is now only proposed to indicate very briefly certain changes in the law which will affect the work of the Public Analyst. In future, the probable cumulative effects of injurious substances must be taken into consideration ; there are now special provisions relating to cream substitutes ; the sections devoted to sampling and analysis have been extended and provision has been included for a public analyst, who for any reason is unable to perform an effective analysis, to send the sample to another public analyst ; penalties have been increased and the time limit for the institution of legal proceedings has been increased for foods other than milk ; " analysis " now includes micro-biological assay and " food " now includes chewing gum and other similar products.

The following list of new regulations made during the year 1955 includes those, in addition to the Food and Drugs Act, 1955, which are of special interest to public analysts :—

The Transfer of Functions (Ministry of Food) Order, 1955.
The Transfer of Functions (Food and Drugs) Order, 1955.
The Food Standards (Butter and Margarine) Regulations, 1955.
The Labelling of Food (Amendment) Regulations, 1955.
The Mineral Oil in Food (Amendment) Regulations, 1955.
The Bread (Amendment) Order, 1955.
The Food Standards (Table Jellies) (Amendment) Order, 1955.

The above mentioned Orders are briefly described in the following paragraphs or in the sections of this report which deal with the commodities concerned. Mention should also be made here of two reports, published in the year 1955, by the Food Standards Committee of the Ministry of Agriculture, Fisheries and Food on colouring matters in foods and the Addendum 1955 to the British Pharmacopoeia, 1953. Both of these are also discussed in subsequent paragraphs.

It will be remembered that under the Transfer of Functions (Food and Drugs) Order, 1948, the Ministry of Food became the department primarily concerned with certain matters in the Food and Drugs Act, 1938, and related Regulations which had previously been the province

of the Ministry of Health. These included : the composition and description of food (including the Preservative Regulations and the Condensed Milk and Dried Milk Regulations) ; food inspection and hygiene ; Milk and Dairies Regulations and Milk (Special Designations) Regulations and the approval of the terms of appointment, etc., of Public Analysts. The Ministry of Food was, however, dissolved by the Transfer of Functions (Ministry of Food) Order, 1955, which came into operation on the 7th April, 1955, and its functions were transferred to the Minister of Agriculture, Fisheries and Food. Subsequent to this another Order known as the Transfer of Functions (Food and Drugs) Order, 1955, was made which came into operation on the 6th July, 1955, and which transferred or returned certain functions to the Minister of Health or to the Minister of Agriculture, Fisheries and Food and the Minister of Health acting jointly. The functions transferred to the Minister of Health are concerned chiefly with hygiene and the registration of premises used for the manufacture or sale of ice-cream and preserved food. The Minister of Health and the Minister of Agriculture, Fisheries and Food are now jointly responsible for the making of Specified Areas Orders relating to areas in which the retail sale of milk under a special designation is compulsory.

Sections 32 and 33 of the Food and Drugs Act, 1938, which deal respectively with standards for butter and margarine and with the labelling of margarine and margarine-cheese have not been reproduced in the Food and Drugs Act, 1955, but they are now the subject of special Regulations, *i.e.*, the Food Standards (Butter and Margarine) Regulations, 1955, and the Labelling of Food (Amendment) Regulations, 1955, both of which came into operation on the 1st January, 1956. The first of these Regulations makes similar standards for butter and margarine to those previouly included in the 1938 Act but no reference is made to milk-blended butter which is now of no commercial significance. The chief modifications in the new Labelling Regulations for margarine and margarine-cheese compared with previous requirements are : the use of names and pictorial devices with margarine suggestive of butter or dairy interests are prohibited ; the Minister of Agriculture, Fisheries and Food is no longer responsible for the approval of fancy names for margarine and any claim that margarine is made with or contains cream or milk must be accompanied by a statement of the butter equivalent, which brings claims of this nature into line with claims relating to butter content.

As the result of the new definition of " food " contained in the Food and Drugs Act, 1955, chewing gum and similar products now come within the scope of the Act. Mineral Oil is commonly an ingredient of chewing gum and in view of the fact that the gum is not normally ingested the Mineral Oil in Food (Amendment) Regulations, 1955, have relaxed the

Mineral Oil in Food Order, 1949, to permit the sale of chewing gum containing not more than 12·5 per cent. of mineral oil in the form of microcrystalline wax only. Any possibility of risk to health has been safeguarded by the specification of purity included in the definition of microcrystalline wax given in the amended Regulations, *viz.* :—

> " ' Microcrystalline wax ' means a mixture of solid hyrocarbons obtained from any substance of mineral origin which is white to pale amber in colour and is almost tasteless and odourless, has a melting point not below 160° F., has an iodine number not exceeding 4·0 and conforms to the test for sulphur compounds given in the British Pharmacopoeia monograph for liquid paraffin."

The Bread (Amendment) Order, 1955, which came into operation on the 20th February, 1955, makes provision for the retail sale of National Milk Bread at a higher price than the maximum prescribed for National Bread. The following definition is included in the Order :—

> " ' National milk bread ' means national bread or national brown bread except that in its production not less than six parts by weight of skim milk powder have been added per one hundred parts by weight of national flour or national brown flour used."

There are several points with regard to this Order which are noteworthy. In the first place, no provision is made for the use of other forms of milk than skim milk powder in National Milk Bread ; for example, the use of equivalent amounts of liquid whole milk or full-cream milk powder would not, from the wording of the Order, also entitle a higher retail price to be charged. Secondly, the amount of skim milk powder stipulated is very high and corresponds to nearly 17 lbs. per 280 lb. sack of flour, or to approximately 3·8 per cent. in the crumb of the finished loaf. This quantity of skim milk powder by itself would tend to adversely affect the quality of the dough and the crumb of the loaf unless compensated for by the use of additional fat and water ; the Order does not, however, require an additional quantity of fat to be present in National Milk Bread. Lastly, it is unfortunate that a name has been selected for this commodity which includes the unqualified word " milk " when, in fact, what is present in the bread is only skim milk powder. It would constitute a contravention of the Public Health (Dried Milk) Regulations to sell dried skimmed milk simply as " dried milk " and from this it seems reasonable to assume that where the presence of milk or a milk product is claimed in a food the purchaser should be left in no doubt as to the exact nature of the added ingredient.

The Preservatives Sub-Committee of the Food Standards Committee of the Ministry of Food submitted its report on Colouring Matters in Food in the year 1954 but the report was not published until the 5th January, 1955. Broadly, the report recommends that the Public

Health (Preservatives, etc., in Food) Regulations, 1925–1953, should be amended to permit the use in foods of certain specified colours only instead of, as at present, permitting the use of all colouring matters with the exception of a few prohibited colours. The change recommended will bring this Country more in line with certain other countries, particularly the U.S.A. and Canada ; the list of permitted colours in these last mentioned countries now contains 19 colours. The list of prohibited colours at present in force here includes compounds of the following elements : Antimony, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury and Zinc ; in addition, it includes the vegetable colouring matter Gamboge and only five "Coal tar" colours. The total number of " coal tar " colours now made is very large and any of these, except the five prohibited colours can, at present, be used in food. Very little is, however, known of the biological action of most of the synthetic colours. For this reason the Committee feel that public health would be best safeguarded by having a permitted list of colours restricted to those substances which the available evidence indicates are unlikely to have any harmful effects ; this list to be reviewed periodically. In order to ascertain the safety of a " coal tar " colour for use in food it must be investigated from the point of view of both acute and chronic toxicity and of carcinogenicity. Toxic properties could be due to the dye compound itself or to the presence of impurities such as arsenic, lead, intermediates and other organic impurities. For this reason it is recommended that specifications should be prescribed to control the composition and purity of all permitted colours. The Pharmacology Panel of the Committee have reviewed 79 synthetic colours which have been used in foods and this number includes the 19 colours at present permitted in the United States and Canada. In view of the fact that all these colours have been used extensively in foods in several countries they cannot be acutely toxic but consideration had to be given to the possibility of any of them having any delayed harmful effects on health. Recent experimental evidence and consideration of their chemical structure shows that 35 of these dyes might, in the long run, have harmful effects and these were rejected. The Pharmacology Panel finally formulated a list of 13 natural colours and 32 synthetic colours which they suggest should be the basis, subject to periodical review, of any list of permitted food colouring matters. Two points of particular interest are that the list may not include a synthetic colour suitable for colouring margarine but the Committee feel that it would not be in the public interest to recommend the use of any oil-soluble synthetic colours if there remained any doubt as to their biological action. Already some 75 to 80 per cent. of margarine made in the United Kingdom is coloured with the natural colouring matter carotene and the Committee suggests that its use could be further extended. The other point is that the list does not include certain colours

which are at present permitted as food colours in some other countries including the U.S.A. In this connection, however, it should be mentioned that it is understood that the U.S. Federal Food and Drugs Administration is, at present, also engaged in re-investigating their permitted colours.

In addition to the recommendations referred to above the Report also recommends that all raw and unprocessed foods should not be artificially coloured ; that, in general, notice should be given to the purchaser when a food contains added colour ; that colours for use in food should be appropriately labelled, when sold either by retail or to food manufacturers, to indicate whether a diluted colour or the pure colour is being supplied and in the case of a pure single ingredient colour the " appropriate designation " of the colour as given in the Report should be stated on the label and, finally, that any regulations made in respect of colouring matters in food should also apply to imported foods.

Following representations made by trade and other interested bodies during the year under review a supplementary Report on Colouring Matters was published in December, 1955. This report re-affirmed most of the recommendations in the earlier report but it amplified the Sub-Committee's views on the declaration of the presence of added colour in foods and it slightly modified the proposed list of permitted colours. With regard to the declaration of the presence of added colouring matter, it was pointed out that because certain pre-packed foods are exempt from the need to declare a list of ingredients this does not necessarily imply that the exemption should also apply to colouring matter. Foods of this type which the Sub-Committee feel should bear a declaration of the presence of added colouring matter include sausages, jams, soft drinks, etc. On the other hand where such a declaration would present undue practical difficulties recommendations for exemption have been made and these apply to bread, flour and sugar confectionery, butter, cheese, margarine and frozen confections. The recommended list of permitted natural colours has been revised to include titanium dioxide, ultramarine and all colours of vegetable origin customarily used in foods in the United Kingdom. Silver and aluminium metals and the aluminium and calcium lakes of colours are permitted in certain circumstances. The list of permitted synthetic colours still includes 32 colours but one colour has been deleted from the original list and another added ; the common name of the colour has also been added in each instance.

The Metallic Contamination Sub-Committee of the Food Standards Committee of the Ministry of Food also submitted revised recommendations for limits for arsenic in foods during the year under review. The general limits proposed are the same as those recommended in the original

report published in the year 1949, *viz.*, for beverages ready to drink 0·1 p.p.m. (as As.) and for other foods 1·0 p.p.m. (as As.). The list of foods, however, for which special limits, either above or below the general limits, are recommended has been slightly increased. Where limits above the general limits are recommended the Commodities concerned are either concentrated foods or food adjuncts such as : solid pectin, roasted chicory and chemicals used as ingredients in or in the processing of foods. Particular attention should, however, be drawn to the more stringent limit of 0·5 p.p.m. (as As.) now recommended for ice-cream and ice lollies.

During the year an Addendum was also published to the British Pharmacopoeia, 1953. This is official from the 1st March, 1956, and it gives recognition to additions and amendments to the Pharmacopoeia which are urgently required in the light of advancing knowledge and experience and which could not reasonably be deferred until the publication of the next edition of the Pharmacopoeia. The Addendum includes a monograph on Soluble Aspirin Tablets and also on Chloroquine Phosphate and Sulphate, used for the treatment of malaria ; on Isoniazid, used in the treatment of tuberculosis ; on Lignocaine Hydrochloride, which is a local anaesthetic and on Iopanoic Acid, which is a radio-opaque substance used in radiography of the biliary tract. The official assays of all the above substances are carried out by chemical means and it is interesting to note that the spectographic absorptions at specified wavelengths of three of the compounds are given as tests for identification. Among the amendments which have been introduced the following are of particular interest to the Analyst. Purified water (prepared from potable water by treatment with ion-exchange materials or by distillation) may now be used instead of distilled water where the latter was previously specified. The disintegration test for tablets has been made more precise in that it is now carried out in a standardised apparatus. The Unit of Vitamin A is now defined as 0·344 ug. of all-trans Vitamin A Acetate of British Pharmacopoeia quality instead of, as formerly, the specific activity contained in 0·344 ug. of a Standard Preparation of the same compound. The limit test for fatty acids in glycerin has now been made quantitative but there is still no limit test for volatile fatty acids. This last point is important to the analyst who may use glycerin of British Pharmacopoeia quality in the determination of the volatile fatty acid content of fats. Finally, it should be noted that following adverse reports by Public Analysts and others on the quality of some preparations, due to deterioration on storage, more stringent directions for storage, etc., of these have now been given. Tablets of Penicillin, for example, are now required, in addition to the previous directions for storage, to be packed in a container which prevents the access of moisture. A limit test for moisture is included and notice is given that the tablets deteriorate on exposure

to moist air. In the case of Capsules of Halibut-Liver Oil, the directions for storage, that they should be protected from light and stored in a cool place, have not been altered but the additional information has now been given that under these conditions they should retain their potency for at least three years. In order that there should be no doubt as to the potency in relationship to the age of stocks of this preparation it is now obligatory to state the date of preparation on the label.

Particulars of Samples of Food and Drugs submitted by County Sampling Officers.

In Table 3 there is a list of all the articles of food and drugs which were submitted during the year 1955 from the County of Lancaster together with the number of each kind and also the number found to be adulterated.

Table 3.

Samples examined under the Food and Drugs Acts during 1955.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Almonds, Ground ...	...	18	...	18	...	1	...	1
Ammoniated Tincture of Quinine	...	12	...	12	...	7	...	7
Arrowroot	...	11	...	11	...	...	...	...
Aspirin Tablets ...	...	15	...	15	...	1	...	1
Baby Food ...	...	8	...	8	...	1	...	1
Bacon	...	36	1	37	...	1	...	1
Baking Powder ...	...	28	...	28	...	...	...	...
Barley	...	35	1	36	...	...	...	...
Barley Kernels ...	...	3	...	3	...	...	...	...
Batter Mixture ...	...	1	...	1	...	...	...	...
Beans and Pork Sausages, Canned	...	1	...	1	...	...	...	...
Beef Tea, Bottled ...	...	1	...	1	...	...	...	...
Beer...	...	5	...	5	...	...	...	...
Biscuits	...	5	...	5	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Blanc Mange Powder ...	...	21	1	22	...	...	...	...
Borax	...	13	...	13	...	1	...	1
Boric Acid	...	12	...	12	...	...	...	...
Boric Acid Ointment ...	...	7	...	7	...	...	...	...
Brandy	1	...	...	1	...	...	...	...
Bread	...	21	...	21	...	2	...	2
Bread, Brown ...	...	2	...	2	...	...	...	...
Bread, Fancy (Fruit, etc.) ...	...	2	...	2	...	...	...	...
Butter	...	64	2	66	...	...	...	...
Camphorated Oil ...	...	15	...	15	...	1	...	1
Caraway Seeds ...	...	1	...	1	...	...	...	...
Castor Oil	...	25	...	25	...	...	...	...
Cayenne Pepper ...	...	1	...	1	...	...	...	...
Cereals, Breakfast	...	3	...	3	...	...	...	...
Cheese	...	37	...	37	...	...	...	...
Cheese Spread (including 1 Ham, 1 Tomato) ...	...	6	...	6	...	...	...	...
Chicken Broth, Bottled ...	...	1	...	1	...	...	...	...
Chicken Fillets, Canned	...	1	...	1	...	...	...	...
Chicken, Minced, Bottled ...	...	2	...	2	...	...	...	...
Chicken Spread, Bottled ...	...	1	...	1	...	...	...	...
Chocolate, Drinking	...	2	...	2	...	...	...	...
Cinnamon, Ground	...	8	...	8	...	...	...	...
Cloves, Ground ...	...	3	...	3	...	...	...	...
Cockles, Bottled ...	...	1	...	1	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giv ing rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Cocoa	...	11	...	11	...	...	...	...
Coconut, Desiccated ...	...	2	...	2	...	...	...	...
Codeine Tablets (Compound) ...	...	4	...	4	...	...	...	...
Cod Liver Oil ...	...	14	...	14	...	...	...	...
Coffee	...	34	1	35	...	...	...	...
Coffee and Chicory Mixture, Dry ...	...	2	...	2	...	...	...	...
Coffee Extract, Dry	...	2	...	2	...	...	...	...
Condiment, Non-Brewed ...	...	1	...	1	...	1	...	1
Cooking Fat ...	...	19	2	21	...	...	...	...
Cornflour	...	19	1	20	...	...	...	...
Cough Medicine ...	...	4	...	4	...	...	...	...
Crab, Potted ...	...	2	...	2	...	...	...	...
Cream, Single and Double	...	10	...	10	...	...	...	...
Cream, Sterilised ...	...	28	...	28	...	...	...	...
Cream, Synthetic Powder ...	...	1	...	1	...	...	...	...
Cream of Tartar ...	...	2	...	2	...	...	...	...
Curry Powder ...	...	14	...	14	...	1	...	1
Custard Powder ...	...	26	1	27	...	...	...	...
Dripping	...	23	...	23	...	...	...	...
Epsom Salts ...	...	13	...	13	...	...	...	...
Figs, Syrup of, Compound ...	...	7	...	7	...	...	...	...
Fish Browner ...	...	1	...	1	...	...	...	...
Fish Cakes	...	1	...	1	...	...	...	...
Fish, Canned ...	...	7	2	9	...	...	1	1
Fish Paste ...	...	20	...	20	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Fish, Potted ...	...	2	...	2	...	...	...	...
Flavoured Drink (Milk, etc.) ...	...	2	...	2	...	...	...	...
Flavouring Essences	...	18	...	18	...	1	...	1
Flour	...	29	...	29	...	4	...	4
Flour, Self-raising	...	32	...	32	...	...	...	...
Flour Cake, Sweetened ...	...	2	...	2	...	...	...	...
Flour Confectionery (Jam Tarts, etc.)	...	61	...	61	...	...	...	...
Fruit, Canned ...	...	40	...	40	...	...	...	...
Fruit, Dried ...	...	70	1	71	...	1	...	1
Fruit Curd	...	18	...	18	...	1	...	1
Fruit, Fresh (Apples, Oranges, etc.)	...	34	...	34	...	1	...	1
Fruit Juices ...	1	11	...	12	1	1	...	2
Gin	9	...	...	9	1	...	...	1
Ginger, Ground ...	...	9	...	9	...	...	...	...
Glauber's Salt ...	...	10	...	10	...	2	...	2
Glauber's Salt Tablets (Compound) ...	...	2	...	2	...	...	...	...
Glycerin	...	16	...	16	...	3	...	3
Glycerin of Borax	...	11	...	11	...	...	...	...
Glycerin of Thymol	...	1	...	1	...	...	...	...
Golden Eye Ointment ...	...	5	...	5	...	...	...	...
Golden Raising Powder ...	...	6	...	6	...	...	...	...
Gravy Browning ...	...	35	...	35	...	...	...	...
Gravy Powder ...	...	2	...	2	...	...	...	...
Gripe Water ...	...	2	...	2	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Headache Powders	...	1	...	1	...	...	...	...
Herbs, Dried (Culinary) ...	...	26	...	26	...	...	...	...
Honey	...	12	...	12	...	...	...	...
Ice-Cream	3	52	...	55	1	12	...	13
Ice-Cream, Cold Mix Powder ...	...	2	...	2	...	2	...	2
Ice Lolly	...	12	...	12	...	...	...	...
Indian Brandee ...	...	1	...	1	...	...	...	...
Invalid Food ...	...	1	...	1	...	...	...	...
Iodine, Tincture of	...	25	...	25	...	6	...	6
Jam	...	17	2	19	...	...	...	...
Jam, Diabetic ...	...	1	...	1	...	...	...	...
Jelly, Table ...	...	42	...	42	...	1	...	1
Jelly with Fruit, Bottled ...	...	1	...	1	...	...	...	...
Kali	...	1	...	1	...	...	...	...
Lard	...	50	1	51	...	2	...	2
Lemonade Powder and Crystals ...	...	2	...	2	...	...	...	...
Liquorice Powder ...	...	4	...	4	...	...	...	...
Malt Extract ...	...	2	...	2	...	...	...	...
Malt Extract with Cod Liver Oil ...	...	9	...	9	...	...	...	...
Malt, Milk and Cocoa Beverages	...	10	...	10	...	...	...	...
Margarine	2	64	2	68	1	2	...	3
Marmalade ...	...	22	...	22	...	...	...	...
Marshmallow Creme	...	1	...	1	...	...	...	...
Marzipan	...	7	...	7	...	...	...	...
Meat, Canned ...	...	20	...	20	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Meat Paste ...	...	15	...	15	...	...	...	...
Meat, Potted ...	...	2	...	2	...	...	...	...
Meat and Potato Pie, Canned ...	...	2	...	2	...	1	...	1
Meat Pie (Steak and Kidney) ...	...	1	...	1	...	...	...	...
Meat Pudding, Canned	...	1	...	1	...	...	...	...
Milk	3079	2250	308	5637	139	120	14	273
Milk, Channel Islands	158	21	...	179	9	...	...	9
Milk, Condensed, Full Cream, Sweetened ...	...	4	...	4	...	...	...	...
Milk Condensed, Special Full Cream, Sweetened ...	...	2	...	2	...	...	...	...
Milk Condensed, Full Cream, Unsweetened ...	1	11	...	12	1	4	...	5
Milk Condensed, Skimmed, Sweetened ...	...	5	...	5	...	...	...	...
Milk, Dried... ...	...	4	...	4	...	...	...	...
Milk, Malted ...	...	1	...	1	...	...	...	...
Milk Skimmed and Fat Compound, Canned	...	1	...	1	...	...	...	...
Mincemeat ...	...	22	...	22	...	...	...	...
Mustard Compound	...	14	...	14	...	...	...	...
Mustard, Liquid ...	...	7	...	7	...	...	...	...
Nutmegs, Ground	...	8	...	8	...	...	...	...
Nut Mixture, Ground ...	...	1	...	1	...	...	...	...
Oatmeal	...	30	...	30	...	...	...	...
Olive Oil	...	27	...	27	...	1	...	1

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Pancake and Yorkshire Pudding Mixture	...	1	...	1	...	...	...	...
Paraffin, Liquid ...	...	29	...	29	...	...	...	...
Penicillin Tablets	...	25	...	25	...	4	...	4
Pepper, White ...	...	42	...	42	...	...	...	...
Pepper, Compound	...	...	1	1	...	...	1	1
Pickles	...	44	...	44	...	...	...	...
Pie Filling, Lemon Flavour	...	1	...	1	...	...	...	...
Potato Crisps ...	...	2	...	2	...	1	...	1
Pudding, Christmas, etc. ...	...	27	...	27	...	...	...	...
Pudding, Rice, Canned	...	1	...	1	...	...	...	...
Pudding Mixture (Sago, etc.) ...	...	6	...	6	...	...	...	...
Puff Pastry Mixture	...	1	...	1	...	...	...	...
Raspberry Vinegar and Olive Oil ...	...	1	...	1	...	...	...	...
Rennet, Essence of	...	...	1	1	...	...	...	...
Rice	...	7	...	7	...	...	...	...
Rice, Flaked ...	...	1	...	1	...	...	...	...
Rice, Ground ...	...	6	...	6	...	...	...	...
Rose Hip Syrup ...	...	2	...	2	...	...	...	...
Rum	5	...	...	5	...	...	...	...
Rum Butter ...	...	2	...	2	...	1	...	1
Saccharin Tablets	...	8	...	8	...	...	...	...
Sago	...	13	...	13	...	3	...	3
Salad Cream ...	...	10	...	10	...	...	...	...
Salt	...	17	...	17	...	1	...	1

Table 3—continued.

Samples.	Number examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Salt, Iodised ...	...	2	...	2	...	...	...	...
Sauce	...	26	...	26	...	...	...	...
Sausages, Beef ...	...	35	...	35	...	10	...	10
Sausages, Pork ...	4	37	...	41	3	13	...	16
Sausages, Cumberland ...	...	1	...	1	...	...	...	...
Sausages, Canned ...	...	2	...	2	...	...	...	...
Sausage Meat, Beef	...	1	...	1	...	1	...	1
Sausage Meat, Pork	...	2	...	2	...	...	...	...
Semolina	...	28	...	28	...	...	...	...
Shrimps, Potted ...	...	2	...	2	...	...	...	...
Sodium Bicarbonate ...	...	12	...	12	...	...	...	...
Soft Drinks, Concentrated ...	...	12	...	12	...	1	...	1
Soft Drinks, Mineral Waters ...	...	12	...	12	...	...	...	...
Soft Drinks, Orange Drinks ...	...	18	...	18	...	7	...	7
Soft Drink, Blackcurrant Drink	...	1	...	1	...	1	...	1
Soft Drink, Glucose Drink ...	...	1	...	1	...	...	...	...
Soft Drink, Tonic Water ...	...	1	...	1	...	...	...	...
Soft Drink, Non-Alcoholic Beverage... ...	...	1	...	1	...	...	...	...
Soup, Canned ...	...	16	...	16	...	1	...	1
Soup Mixture (Dried Vegetables, Barley, etc.) ...	...	1	...	1	...	...	...	...
Spice, Mixed, Ground ...	...	22	...	22	...	...	...	...
Spice, Pickling ...	...	1	...	1	...	...	...	...

Table 3—continued.

Samples.	Number examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Sponge Cake and Sponge Pudding Mixture, Sweetened ...	...	9	...	9	...	2	...	2
Sponge Cake and Sponge Pudding Mixture, Unsweetened ...	...	1	...	1	...	1	...	1
Stout	...	2	...	2	...	...	...	...
Stuffing (Sage and Onion)	...	1	...	1	...	...	...	...
Suet, Shredded ...	...	1	...	1	...	...	...	...
Sugar	...	25	...	25	...	...	...	...
Sugar (Tinted Crystals) ...	...	1	...	1	...	...	...	...
Sugar, Icing ...	...	9	...	9	...	...	...	...
Sweets (including Chocolates) ...	...	45	...	45	...	...	...	...
Sweetmeat	...	3	...	3	...	...	...	...
Syrup	...	4	...	4	...	...	...	...
Tapioca	...	30	...	30	...	4	...	4
Tartaric Acid ...	...	1	...	1	...	...	...	...
Tea	...	57	1	58	...	...	...	...
Tea Extender ...	...	1	...	1	...	1	...	1
Teething Powders ...	...	8	...	8	...	2	...	2
Teething Syrup ...	...	1	...	1	...	...	...	...
Tomatoes, Fresh ...	...	1	...	1	...	...	...	...
Treacle and Molasses	...	23	...	23	...	2	...	2
Trifle Pack ...	...	1	...	1	...	...	...	...
Turkey, Minced, Bottled ...	...	1	...	1	...	...	...	...
Turkish Delight ...	...	1	...	1	...	...	...	...
Vegetables, Canned	...	25	...	25	...	...	...	...

Samples.	Number examined.				Number adultered or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Vegetables, Dried (Peas, etc.) ...	...	34	...	34	...	...	...	...
Vinegar	...	17	...	17	...	1	...	1
Vodka (Polish) ...	1	...	...	1	...	...	...	...
Welsh Rarebit (Bottled) ...	...	1	...	1	...	...	...	...
Whey Cream ...	...	1	...	1	...	...	...	...
Whisky	36	...	...	36	2	...	...	2
Wine (British Sherry, British Ruby, etc.) ...	...	6	...	6	...	...	...	...
Yeast Tablets ...	...	1	...	1	...	...	...	...
Yeast and Meat Extract	...	1	...	1	...	...	...	...
Zinc Ointment ...	...	25	...	25	...	...	...	...
Totals ...	3300	4744	329	8373	158	239	16	413

The Number of Commodities.

The variety of commodities on sale is now very large, and this is reflected in the number of different articles of which samples have been taken and submitted for analysis. Two hundred and twelve different commodities consisting of food and drugs were examined during the year.

In order to obtain adequate sampling of the common articles of food it is the practice to issue quarterly lists of samples which assist the sampling officers to correlate their samples one with another and at the same time ensure that each area is satisfactorily sampled in respect of any particular commodity. Due to the desirability of allowing considerable latitude in the sampling of other articles where this may be indicated in the public interest, the variety of samples actually examined is considerably increased by the inclusion of commodities in less common demand.

Total Adulteration.

During the year under review, 8,373 samples of food and drugs were submitted for examination under the Acts, and of these 413 were reported upon adversely; the total adulteration was, therefore, 4·9 per cent. This represents a slight decrease compared with the percentage of adulteration for the previous year (1954) when the figure was 5·1 per cent.

In table 4 the percentages of adulteration are given for the past 10 years. It will be seen that during this period the lowest figure is 4·5 which was reached during the years 1950 and 1953, and that the average figure is 5·3 per cent., so that the percentage of adulteration for the year 1955, which is 4·9, is lower than the average for the past 10 years. In general, the adulteration during and subsequent to the war is considerably greater than that found in preceding years ; while the figure for the year under review cannot be regarded as unsatisfactory when compared with the average figure for the last 10 years, it is appreciably higher than the adulteration for the 10 years 1929–1938, which preceded the war, when the percentage adulteration varied from 2·6 to 4·2.

Table 4.

Percentage of Adulteration of County Samples of Food and Drugs, 1946–1955.

Year.	Total No. of Samples.	No. of Adulterated Samples.	Percentage of Adulteration.
1946	4,122	315	7·6
1947	6,819	477	7·0
1948	6,958	399	5·7
1949	7,700	408	5·3
1950	8,104	363	4·5
1951	8,501	412	4·8
1952	8,622	404	4·7
1953	8,635	386	4·5
1954	8,089	417	5·1
1955	8,373	413	4·9
1946–1955 ...	75,923	3,994	5·3

Analysis of County Food and Drugs Samples.

The point raised in the preceding paragraph is perhaps brought out more clearly in table 5 where the percentage of adulteration over the last 10 years is given side by side with the various types of samples and with the number of samples taken per 100,000 of the population. Reference to table 2 will show that during the war years the rate of sampling dropped very considerably, in fact for the years 1942–1945 inclusive it was less than half that for the years immediately prior to the war. The total number of samples and the number of samples per 100,000 of the population for the year under review have been well maintained at the

level reached during 1947 and the figures for the last nine years are much higher than the corresponding figures for any previous year in the history of the County Laboratory.

Table 5.

Year.	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
Percentage of Adulteration	7·6	7·0	5·7	5·3	4·5	4·8	4·7	4·5	5·1	4·9
Total Samples ..	4,122	6,819	6,958	7,700	8,104	8,501	8,622	8,635	8,089	8,373
Formal Samples ..	1,648	2,318	2,478	3,011	2,798	2,751	2,654	3,220	2,817	3,300
Informal Samples ..	2,046	3,821	3,953	4,254	4,858	5,184	5,313	4,761	4,844	4,744
Private Samples ..	428	680	527	435	448	566	655	654	428	329
Number of Samples per 100,000 of the population	321	505	504	546	566	589	599	598	593	613

Total Adulteration : the County compared with other Areas.

Table 6 gives the percentage of adulteration for the year 1955 for certain other Food and Drugs Authorities whose figures were available at the time of writing. I am indebted to the Public Analysts of the various districts for the information included in this table and also for the figures included in tables 13 and 18. It will be seen that the figure for the County of Lancaster, *viz.*, 4·9 per cent., is very slightly above the average (4·5 per cent.) for the Authorities mentioned. The range of adulteration for the areas included in the table varied from 7·9 to 1·2 per cent.

Table 6.

Total Adulteration, 1955. Various Districts.

Area.	No. of Samples.	Per cent. of Adult.	Area.	No. of Samples.	Per cent. of Adult.
Somersetshire, County ...	3,066	4·2	Leeds	2,725	3·0
Staffordshire, County ...	4,925	3·0	Leicester	2,780	4·7
Surrey, County ...	1,331	4·5	Liverpool	3,965	5·8
Worcestershire, County ...	5,149	7·9	Manchester ...	3,043	5·2
Birmingham ...	5,544	6·1	Portsmouth ...	1,832	5·6
Bristol	3,179	1·2	Salford	1,111	3·5

Total Adulteration : England and Wales.

It is interesting to compare the position as regards adulteration in Lancashire, which is 4·9 per cent., with the corresponding figures for years between the wars for the whole of England and Wales. In table 7 there are given the figures for a long period, 34 years, omitting the years of both

wars. It will be seen that the total adulteration in Lancashire for the year under review is less than the average (6·6 per cent.) for England and Wales for the years between the wars. This is the eighth occasion since the year 1940 that the adulteration rate for the County has fallen below the average for that of England and Wales for all the years shown in the table, the first occasion being the year 1948, when the total adulteration rate was 5·7 per cent.

Table 7.

Percentage of Adulteration for England and Wales, 1900–1938.

Year.	Milk.			Total Samples.		
	Number examined.	Number adulterated.	Percentage of Adult.	Number examined.	Number adulterated.	Percentage of Adult.
*1900–1913...	569,916	62,318	10·9	1,250,686	105,076	8·4
1919	57,361	6,374	11·1	101,140	8,313	8·2
1920	62,463	5,797	9·3	111,797	7,903	7·1
1921	61,439	5,290	8·6	113,664	7,582	6·7
1922	60,274	4,624	7·7	113,860	7,106	6·2
1923	59,925	4,684	7·8	114,846	6,980	6·1
1924	62,133	4,773	7·7	118,000	6,987	5·9
1925	61,909	5,163	8·3	118,930	7,714	6·5
1926	62,507	4,625	7·4	120,617	7,044	5·8
1927	63,687	4,398	6·9	124,264	6,787	5·5
1928	67,350	5,542	8·2	129,034	7,524	5·8
1929	68,115	5,293	7·8	133,584	7,260	5·4
1930	69,311	4,581	6·6	136,515	6,496	4·8
1931	70,201	4,507	6·4	136,169	6,324	4·6
1932	72,940	5,307	7·3	137,981	7,019	5·1
1933	74,545	5,760	7·7	138,171	7,601	5·5
1934	76,930	5,506	7·2	140,583	7,451	5·3
1935	78,674	5,798	7·4	143,831	7,972	5·5
1936	80,082	5,706	7·1	146,438	7,802	5·3
1937	82,357	6,107	7·4	151,370	8,401	5·5
1938	80,025	6,141	7·7	149,073	8,433	5·7
Totals ...	1,942,144	168,294	8·7	3,830,553	253,775	6·6

* Figures for 1914–1918 and 1939–1955 inclusive, not available.

Adulteration in County Districts, etc.

There are 92 Districts shown in the Area of the County Food and Drugs Authority for the year under review.

Table 8 shows the number of samples taken and the number of adulterated samples in each of the 92 districts together with those relating to 10 autonomous areas. An examination of the table will show that adulteration was nil in 24 of the County Districts as against nil in 13 districts for the year 1954. None of the autonomous areas showed a total freedom from adulteration.

Table 8.

Adulteration in the County Districts and in the areas of ten Autonomous Food and Drugs Authorities during the year 1955.

District.	Milk.		Other Articles.		Total.	
	Samples.	Adult.	Samples.	Adult.	Samples.	Adult.
Abram U.D.C.	10	0	14	0	24	0
Adlington U.D.C. ...	24	0	13	0	37	0
Ashton-in-Makerfield U.D.C....	50	0	58	1	108	1
Aspull U.D.C.	20	0	14	0	34	0
Atherton U.D.C. ...	62	2	38	2	100	4
Audenshaw U.D.C. ...	35	1	26	0	61	1
Bacup Borough ...	62	7	29	7	91	14
Barrowford U.D.C. ...	16	0	10	1	26	1
Billinge and Winstanley U.D.C....	21	0	15	1	36	1
Blackburn R.D.C. ...	41	4	24	4	65	8
Blackrod U.D.C. ...	10	3	9	1	19	4
Brierfield U.D.C. ...	24	1	11	0	35	1
Burnley R.D.C. ...	58	10	27	5	85	15
Carnforth U.D.C. ...	17	0	10	1	27	1
Chadderton U.D.C. ...	93	1	65	5	158	6
Chorley R.D.C.	137	10	41	5	178	15
Church U.D.C.	19	0	11	0	30	0

Table 8—continued.

District.	Milk.		Other Articles.		Total.	
	Samples.	Adult.	Samples.	Adult.	Samples.	Adult.
Clayton-le-Moors U.D.C.	23	0	12	0	35	0
Clitheroe Borough ...	37	1	23	0	60	1
Clitheroe R.D.C. ...	45	3	8	0	53	3
Crompton U.D.C. ...	37	1	29	3	66	4
Dalton-in-Furness U.D.C....	31	4	27	1	58	5
Denton U.D.C. ...	82	4	48	3	130	7
Droylsden U.D.C. ...	88	1	45	4	133	5
Failsworth U.D.C. ...	57	0	38	1	95	1
Farnworth Borough ...	79	0	70	3	149	3
Fleetwood Borough ...	67	0	73	5	140	5
Formby U.D.C. ...	28	0	17	1	45	1
Fulwood U.D.C. ...	59	2	32	3	91	5
Fylde R.D.C.	64	7	33	3	97	10
Garstang R.D.C. ...	87	6	32	3	119	9
Golborne U.D.C. ...	48	0	36	0	84	0
Grange U.D.C.	14	2	9	1	23	3
Great Harwood U.D.C.	43	0	16	2	59	2
Haslingden Borough ...	51	2	19	0	70	2
Haydock U.D.C. ...	31	0	27	0	58	0
Heywood Borough ...	73	2	51	6	124	8
Hindley U.D.C. ...	49	1	44	1	93	2
Horwich U.D.C. ...	41	0	43	0	84	0
Ince-in-Makerfield U.D.C.	52	0	58	4	110	4
Irlam U.D.C.	52	2	23	2	75	4
Kearsley U.D.C. ...	28	0	23	0	51	0
Kirkham U.D.C. ...	26	0	7	0	33	0
Lancaster R.D.C. ...	86	9	44	5	130	14
Lees U.D.C.	23	0	8	0	31	0

Table 8—continued.

District.	Milk.		Other Articles.		Total.	
	Samples.	Adult.	Samples.	Adult.	Samples.	Adult.
Leyland U.D.C. ...	38	2	47	5	85	7
Litherland U.D.C. ...	104	5	35	0	139	5
Little Lever U.D.C. ...	21	0	3	0	24	0
Littleborough U.D.C. ...	31	1	24	0	55	1
Longridge U.D.C. ...	18	8	6	2	24	10
Lunesdale R.D.C. ...	63	5	15	0	78	5
Lytham St. Annes Borough	82	0	68	1	150	1
Milnrow U.D.C. ...	34	4	14	1	48	5
Mossley Borough ...	34	5	22	1	56	6
Nelson Borough ...	120	1	52	2	172	3
Ormskirk U.D.C. ...	44	0	57	0	101	0
Orrell U.D.C.	32	0	14	0	46	0
Oswaldtwistle U.D.C. ...	68	0	20	0	88	0
Padiham U.D.C. ...	30	6	26	2	56	8
Poulton-le-Fylde U.D.C.	30	0	10	0	40	0
Preesall U.D.C.	20	1	11	1	31	2
Prescot U.D.C. ...	46	0	32	0	78	0
Preston R.D.C.	129	7	81	2	210	9
Prestwich Borough ...	127	3	58	1	185	4
Radcliffe Borough ...	74	1	73	2	147	3
Rainford U.D.C. ...	10	0	14	0	24	0
Ramsbottom U.D.C. ...	43	1	36	2	79	3
Rawtenstall Borough	83	3	42	4	125	7
Rishton U.D.C. ...	26	1	10	0	36	1
Royton U.D.C. ...	49	3	25	2	74	5
Skelmersdale U.D.C. ...	19	0	15	0	34	0
Standish-with-Langtree U.D.C....	23	0	14	0	37	0

Table 8—continued.

District.	Milk.		Other Articles.		Total.	
	Samples.	Adult.	Samples.	Adult.	Samples.	Adult.
Thornton Cleveleys U.D.C....	46	2	31	0	77	2
Tottington U.D.C. ...	28	1	15	2	43	3
Trawden U.D.C. ...	9	0	1	0	10	0
Turton U.D.C.	46	1	22	2	68	3
Tyldesley U.D.C. ...	52	1	38	2	90	3
Ulverston R.D.C. ...	112	14	26	1	138	15
Ulverston U.D.C. ...	36	4	24	5	60	9
Up Holland U.D.C. ...	20	0	6	0	26	0
Urmston U.D.C. ...	133	8	77	4	210	12
Walton-le-Dale U.D.C.	73	0	32	2	105	2
Wardle U.D.C.	13	0	13	1	26	1
Warrington R.D.C. ...	139	0	31	0	170	0
West Lancashire R.D.C.	115	6	84	2	199	8
Westhoughton U.D.C. ...	65	4	19	0	84	4
Whiston R.D.C.... ...	213	2	54	1	267	3
Whitefield U.D.C. ...	35	0	34	1	69	1
Whitworth U.D.C. ...	28	1	16	1	44	2
Wigan R.D.C.	72	0	22	2	94	2
Withnell U.D.C. ...	9	0	6	0	15	0
Worsley U.D.C. ...	94	2	51	2	145	4
Miscellaneous	801	84	0	0	801	84
Total County Districts	5637	273	2736	140	8373	413
Ten Autonomous Food and Drugs Authorities	1200	63	783	56	1983	119
Total all Sources ...	6837	336	3519	196	10356	532

Adulteration of Milk in the County.

The number of milks submitted under the Food and Drugs Acts during the year was 5,637, and of these 273 were reported against ; the amount of adulteration was, therefore, 4·8 per cent. This figure, as will be seen from table 9, is considerably lower than the average for the last 10 years and together with the figure for 1953 (which was also 4·8 per cent.) is the lowest shown in the table.

Table 9.

Percentage of Adulteration of Milk Samples, 1946–1955.

Year.	No. of Samples.	No. of Adulterated Samples.	Percentage of Adulteration.
1946	2,669	272	10·2
1947	4,515	393	8·7
1948	4,464	293	6·6
1949	5,157	301	5·8
1950	5,324	285	5·3
1951	5,811	291	5·0
1952	5,804	298	5·1
1953	5,872	281	4·8
1954	5,115	287	5·6
1955	5,637	273	4·8
Totals ...	50,368	2,974	5·9

The Adulteration of Milk in the County for each month of the year.

In table 10 will be found the figures for the number of milk samples submitted by County Sampling Officers during each month of the year together with the number adulterated and the percentage adulteration. In general it will be noted that the percentage adulteration increases during late winter and decreases in the autumn. The increasing adulteration of milk noted during the winter and first half of the year may be due to two factors : (*a*) the poorer quality of milk towards the end of the winter enables cases of slight adulteration to be detected more readily and, (*b*) the scarcity of milk in the winter may, in some instances, be an incentive to adulteration.

Table 10.

Milk.—Monthly Adulteration, 1955.

Month.	Number of Samples.	Number Adulterated.	Percentage of Adulteration.
January ...	555	18	3·2
February ...	547	32	5·8
March	549	43	7·8
April	434	23	5·3
May	518	41	7·9
June	472	33	6·9
July	394	18	4·6
August	367	17	4·6
September ...	419	21	5·0
October	501	8	1·6
November ...	539	8	1·5
December ...	342	11	3·2
Total ...	5,637	273	4·8

In the following table will be found particulars of the various types of adulteration and the number of samples under each heading :—

Table 11.

			Per cent.
Milks deficient in fat only	125	*or*	2·21
Milks containing added water only	124	*or*	2·19
Milks deficient in fat and containing added water	21	*or*	0·37
Milks containing visible dirt	1	*or*	0·01
Milks deficient in fat and containing added salt	1	*or*	0·01
Milks containing added salt only	1	*or*	0·01
Milks containing preservatives	Nil	*or*	Nil
Milks containing colouring matter	Nil	*or*	Nil
	273	*or*	4·80
Milks containing more than 3 per cent. added water	47	*or*	0·83
Milks 10 per cent. or more deficient in fat ...	54	*or*	0·95

" Serious " and " Less Serious " Adulteration.

At first sight it may seem unjustifiable to speak of " serious " and " less serious " aspects of adulteration, for any adulteration of such an indispensable article of the diet as milk, must be regarded as serious. The figures, therefore, given in table 11 for adulteration include all samples which were found to be deficient in fat or which contained added water, irrespective of whether the deficiency or the added water was small, or great enough to justify a prosecution.

It has been the practice for some years now in these Reports, however, to attempt to distinguish between " serious " and " less serious " adulteration and since a useful purpose appears to be served by the classification it is continued this year. The general principle is to include under the term " serious," samples so grossly adulterated as to justify the institution of legal proceedings on analytical grounds and to class the rest, still adulterated, but not to so great an extent, under the term " less serious."

A study of table 11 reveals that 1·78 per cent. or considerably less than half of the total milk adulteration may be considered " serious." This figure includes 47 samples which contained added water and 54 samples which were deficient in fat. A number of these seriously adulterated samples were taken informally and could not, therefore, be the subject of prosecutions. In several other instances corresponding appeal-to-cow samples of poor quality were submitted by the Sampling Officers. Prosecutions were recommended, however, in respect of 21 samples.

It will be noted that in addition to samples deficient in fat or containing water there are three samples in table 11 one of which contained visible dirt, one was deficient in fat and contained added salt and one contained added salt only. These were all informal samples. The vendor of the sample that contained visible dirt (of the nature of dung 23 parts per 100,000 parts of the sample) was cautioned and a follow-up sample taken one week later was found to be satisfactory. The two remaining samples (one deficient of 8·3 per cent. fat and containing 0·17 per cent. of added salt and the other containing 0·24 per cent. of added salt only) were both obtained from the same farmer. The farmer was interviewed and further samples taken a few days later were found to be genuine.

In table 12 are given details in regard to the adulterated milk samples submitted by County Sampling Officers, which were the subject of legal proceedings, together with the results of the prosecutions.

Table 12.

Milk Prosecutions, 1955.

Number of Sample.	Nature of Adulteration or Irregularity.	Observations.
N.3368	Deficient 11·8% solids-not-fat ; freezing point indicated 9·8% extraneous water	Section 3 Food and Drugs Act, 1938. Discharged on payment of £2 2s. costs.
N.3405	Deficient 6·9% solids-not-fat ; freezing point indicated 6·2% extraneous water	Section 3 Food and Drugs Act, 1938. Fined £3 3s. and £3 3s. costs.
S.4399	Deficient 8·3% fat and 15·6% solids-not-fat ; freezing point indicated 10·5% extraneous water	Same vendor. Section 9 sub-section (1) (c) Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950. Fined £6 and £7 4s. costs.
S.4400	Deficient 15·4% solids-not-fat ; freezing point indicated 11·0% extraneous water	
S.4401	Deficient 10·3% solids-not-fat ; freezing point indicated 6·2% extraneous water	
C.3473	Deficient 38% fat	Section 83 Food and Drugs Act, 1938. Fined £2 and £4 4s. costs.
N.3713	Deficient 20% fat	Section 3 Food and Drugs Act, 1938. Case dismissed.
C.3645	Deficient 11·5% solids-not-fat ; freezing point indicated 10·7% extraneous water	Same vendor. Section 3 Food and Drugs Act, 1938. Fined £5 and £6 6s. costs.
C.3646	Deficient 33·3% fat and 12·9% solids-not-fat ; freezing point indicated 12·3% extraneous water	
C.3819	Deficient 23·3% fat	Section 3 Food and Drugs Act, 1938. Fined £1 and £1 1s. costs.
N.4121	Deficient 7·0% solids-not-fat ; freezing point indicated 5·5% extraneous water	Same vendor. Section 3 Food and Drugs Act, 1938. Fined £40 and £7 7s. costs. Prosecution not instituted in respect of sample No. N.4125.
N.4124	Deficient 7·6% solids-not-fat ; freezing point indicated 8·8% extraneous water	
N.4125	Deficient 2·6% fat and 6·1% solids-not-fat ; freezing point indicated 0·3% extraneous water	
E.5353	Deficient 19·5% solids-not-fat ; freezing point indicated 19·4% extraneous water	Section 3 Food and Drugs Act, 1938. Fined £10 and £1 1s. costs.
S.5381	Deficient 26·6% fat	Section 3 Food and Drugs Act, 1938. Fined £5 and £4 4s. costs.
C.4181	Deficient 13·3% fat and 12·0% solids-not-fat ; freezing point indicated 14·9% extraneous water	Same vendor. Section 3 Food and Drugs Act, 1938. Fined £9 and £8 8s. costs.
C.4182	Deficient 18·2% solids-not-fat ; freezing point indicated 19·6% extraneous water	

Number of Sample.	Nature of Adulteration or Irregularity.	Observations.
C.4183	Deficient 30% fat and 23·2% solids-not-fat; freezing point indicated 26·6% extraneous water	
N.4497	Deficient 5·2% solids-not-fat; freezing point indicated 5·3% extraneous water	Section 3 Food and Drugs Act, 1938. Fined £2 and £5 5s. costs.
N.4575	Deficient 18·3% fat and 25·3% solids-not-fat; freezing point indicated 27·0% extraneous water	Same vendor. Section 3 Food and Drugs Act, 1938. Fined £5 and £5 5s. costs.
N.4576	Deficient 18·3% fat and 25·3% solids-not-fat; freezing point indicated 27·0% extraneous water	
E.6148	Deficient 6·1% solids-not-fat; freezing point indicated 5·1% extraneous water	Section 3 Food and Drugs Act, 1938. Costs £4 8s.

Adulteration of Milk : the County compared with Other Areas.

In the following table the percentage of milk adulteration for the year 1955 is given for a number of districts in England whose figures were available at the time of writing. The corresponding figure for the County of Lancaster was 4·8 per cent., as against 5·6 per cent. in the year 1954 and 4·8 per cent. in the year 1953. The percentage of milk adulteration in the County for the year under review is slightly lower than the average (5·2 per cent.) for the areas included in the table. The rate of adulteration in these districts varied from 10·2 to 2·3 per cent.

Table 13.

Milk Adulteration, 1955. Various Districts.

Area.	Number of Samples.	Per cent. of Adult.	Area.	Number of Samples.	Per cent. of Adult.
Somersetshire, County ...	1,651	4·7	Leeds	2,555	2·3
Staffordshire, County ...	3,797	2·9	Leicester	2,052	3·4
Surrey, County ...	1,062	3·0	Liverpool	2,800	6·1
Worcestershire, County ...	3,974	8·7	Manchester ...	1,319	10·2
Birmingham ...	2,861	9·5	Portsmouth ...	706	3·7
Bristol	525	5·5	Salford	866	2·8

Adulteration of Milk : England and Wales.

In table 14 there are set out the percentages of milk adulteration for the whole of England and Wales for a long period, 34 years, omitting the years of both wars, which are, unfortunately, not available. It will be

seen that the figure for milk adulteration in the County, *i.e.*, 4·8 per cent. is lower than the average for the whole of England and Wales for the 34 years mentioned. In fact, in none of the years included in the table was the milk adulteration for England and Wales lower than that of the County for the year under review. Furthermore, this is the eighth time since the year 1940 that the figure for milk adulteration has fallen below the average for England and Wales for the years included in the table, the first time being in the year 1948 when the milk adulteration was 6·6 per cent.

Table 14.

Percentage of Milk Adulteration for England and Wales, 1900–1938.

Year.	Number Examined.	Number Adulterated.	Percentage of Adulteration.
*1900–1913 ...	569,916	62,318	10·9
1919	57,361	6,374	11·1
1920	62,463	5,797	9·3
1921	61,439	5,290	8·6
1922	60,274	4,624	7·7
1923	59,925	4,684	7·8
1924	62,133	4,773	7·7
1925	61,909	5,163	8·3
1926	62,507	4,625	7·4
1927	63,687	4,398	6·9
1928	67,350	5,542	8·2
1929	68,115	5,293	7·8
1930	69,311	4,581	6·6
1931	70,201	4,507	6·4
1932	72,940	5,307	7·3
1933	74,545	5,760	7·7
1934	76,930	5,506	7·2
1935	78,674	5,798	7·4
1936	80,082	5,706	7·1
1937	82,357	6,107	7·4
1938	80,025	6,141	7·7
Totals ...	1,942,144	168,294	8·7

* Figures for 1914–1918 and 1939—1955 inclusive, not available.

Milk.

General.

As in previous years the greater proportion of the samples submitted during the year consisted of milk ; the number of samples of milk was 5,637 out of a total number of samples submitted of 8,373.

The first impression created may be that the number of samples of milk seems unduly high as compared with the number of other samples. Taking into account, however, the fact that every day's production represents a separate consignment probably delivered in bottles or churns any one of which might be adulterated and the others genuine, also the perishable nature of the commodity and the importance attached to milk as a food particularly for children, mothers and invalids, it is essential that adequate steps should be taken to ensure an unadulterated supply.

Such circumstances as these have led to the conclusion that, for the detection of adulteration and in order to safeguard the quality of daily supplies, it is advisable to take a relatively large proportion of samples of milk. In a memorandum issued by the Clerk of the Lancashire County Council, it is suggested that out of each 100 samples of food and drugs taken, about 60 should consist of milk.

The Standards of Quality for Milk.

In some countries there is a definite standard of quality required for liquid milk sold to the public ; it is then illegal to sell milk which is below that standard. In this country the law is less stringent. The present Food and Drugs Acts which were in operation during the year under review were passed in the years 1938 and 1950, but they contain no standards for milk. The position remains very much as it was before these Acts came into operation, in that the one requirement laid down by law is that milk must be sold to each purchaser in the condition in which it came from the cow. If it attains a certain limit or exceeds it, it is to be regarded as above suspicion, and if it is below that limit it only becomes suspect, and it falls to the lot of the person who sold it to establish, if he can, before the Court that nothing has been added to it, or no ingredient abstracted from it.

In furtherance of the principle outlined in the preceding paragraph, presumptive limits for the composition of milk were established after exhaustive enquiries by a Government Committee appointed by the Board of Agriculture in 1900.

The outcome of the deliberations of this Committee was the production of the Sale of Milk Regulations, 1901, which were modified as regards skimmed milk in 1912. These Regulations were reproduced, in effect unaltered, in October 1939, in the Sale of Milk Regulations, 1939, made by the Ministry of Agriculture and Fisheries. They are as follows :—

> (1) Where a sample of milk (not being milk sold as separated, or condensed, milk) contains less than 3 per cent. of milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1938,

until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-fat, or the addition thereto of water.

(2) Where a sample of milk (not being milk sold as separated, or condensed, milk) contains less than 8·5 per cent of milk-solids other than milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1938, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-solids other than milk-fat, or the addition thereto of water.

(3) Where a sample of separated milk (not being condensed milk) contains less than 8·7 per cent. of milk-solids other than milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1938, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-solids other than milk-fat, or the addition thereto of water.

It will be seen from the above Regulations that no definite standard for milk is set up by them. They say, in effect, that a suspicion that adulteration may have been practised is to be entertained if either the fat falls below 3·0 per cent. or the non-fatty solids below 8·5 per cent. The very fact that failure to attain the limits only raises a presumption that milk is adulterated, means that it is admitted that a milk may be genuine, that is, not tampered with in any way, although it does not reach the figure for fat or solids-not-fat or both.

That is one side of the picture, a milk may be genuine so far as the law is concerned, and yet contain less than 3·0 per cent. of fat and 8·5 per cent. of solids-not-fat. Many milks, in fact most milks, however, have a composition well above 3·0 per cent. of fat. For instance, the average fat content of all the milks analysed in the County during the year was 3·68 per cent. Similarly the solids-not-fat are usually above 8·5 per cent., the average for the year being 8·66 per cent. The solids-not-fat may be considerably higher than the average figure just mentioned and an appreciable amount of water could then be added without bringing the solids-not-fat below the presumptive limit. For example, if a milk contained 9·3 per cent. of solids-not-fat it would be possible to add about 8·6 per cent. of water without the milk falling below the limit of the Sale of Milk Regulations. This possibility has been anticipated and provided for by Section 9 of the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950, which re-enacts Section 24 of the 1938 Act, under which it is an offence to add water to milk (irrespective of the composition of the resulting mixture). The Hortvet Freezing Point Test enables the analyst to detect the presence and determine the amount of extraneous water in milk even in cases where the solids-not-fat have not been reduced below 8·5 per cent.

Channel Islands Milk and South Devon Milk.

In addition to the above standards of quality, which are applicable to all milk, a special standard for butter-fat content of not less than four per cent. is prescribed in The Milk (Great Britain) Order, 1954, for " Channel Islands Milk " and a similar standard is also included in the Order in respect of " South Devon Milk." Such milk is defined (*a*) as produced by cows of the Channel Islands breeds or the South Devon breed, and (*b*) which the producer thereof sells by retail or in respect of which he receives a premium paid through the medium of a premium contract issued by The Milk Marketing Board and (*c*) which is labelled " Channel Islands Milk " or " Jersey Milk," " Guernsey Milk " or " South Devon Milk " when sold in a container. The enforcement of the above Order is the responsibility of the Ministry of Agriculture, Fisheries and Food and in cases where the fat content of Channel Islands milk or South Devon milk falls below four per cent., but not below three per cent., any proceedings would normally be instituted by the Ministry of Agriculture, Fisheries and Food. During the year, 1955, 200 samples of Channel Islands milk were examined (119 were submitted by County Sampling Officers and 21 by Autonomous Authorities). They were found upon analysis to have an average butter-fat content of 4·93 per cent., and an average solids-not-fat content of 9·11 per cent. Of the 200 samples examined 190 were satisfactory. Of the 10 unsatisfactory samples (9 County) No's. C.3471, E.4971, E.4980, N.3963, E.5211, S.5092, E.5179 and N.4756, submitted by County Sampling Officers, were found to have butter-fat contents of only 3·65, 3·20, 3·65, 3·95, 3·85, 3·80, 3·85 and 3·50 per cent. respectively and the results of the examinations were brought to the notice of the Ministry of Agriculture, Fisheries and Food. Sample No. N.4756, which had a fat content of only 3·50 per cent., was also found to contain a small amount of extraneous water and in addition to the Ministry being notified of the fat content the vendor was cautioned in regard to the extraneous water. The remaining County Sample No. E.4312, taken formally, was found to contain 13·2 per cent. of extraneous water and legal proceedings were successfully instituted against the supplier who was fined £3 and £4 4s. costs. In addition, one informal sample of Channel Islands milk, submitted by an Autonomous Authority, was found to have a butter-fat content of only 3·90 per cent. but a follow-up sample taken in respect of this was found to be genuine.

The Average Composition of Milk during the Year.

Genuine milk has not always the same composition. There are natural variations in the amounts both of fat and solids-not-fat in milk as drawn from the cow, and therefore it becomes a matter not only of interest but also of importance and significance, to know the average values for

these two constituents. This information is given for the year 1955 in table 15, where it will be seen that the average figures for fat are 3·68 per cent., for solids-not-fat 8·66 per cent., and for total solids 12·34 per cent.

It should be pointed out that the average compositions and frequencies included in this section of the Report are calculated from the results of all the samples of milk (other than Channel Islands milk) received ; that is to say, there are included all adulterated samples and further, all appeal-to-cow samples, whether they were above or below the limits for fat and solids-not-fat laid down by the Sale of Milk Regulations. The figures for average composition calculated on this basis will, therefore, tend to be somewhat lower than those for genuine milk sold in the County.

Table 15.

Average Composition of Milk, 1955.

Month	Number of Samples.*	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
January	555	3·69	8·60	12·29
February	1,657 549	3·64 3·62	8·60 8·59	12·24 12·21
March	553	3·63	8·60	12·23
April	434	3·56	8·55	12·11
May	1,449 537	3·53 3·55	8·65 8·67	12·18 12·22
June	478	3·49	8·71	12·20
July	403	3·58	8·67	12·25
August	1,196 373	3·66 3·59	8·66 8·62	12·32 12·21
September	420	3·78	8·70	12·48
October	501	3·89	8·79	12·68
November	1,384 540	3·88 3·90	8·76 8·78	12·64 12·68
December	343	3·82	8·69	12·51
Whole year	5,686	3·68	8·66	12·34

* Includes Appeal-to-Cow samples.

The Average Composition of Milk for each Month of the Year.

Table 15 also includes the figures for the averages of fat and solids-not-fat for each month of the year. As regards fat it will be seen that June has the lowest figure, 3·49 per cent., and November the highest, 3·90 per cent. In respect of solids-not-fat, the lowest figure was obtained

in April, 8·55 per cent., the highest in October, the figure then being 8·79 per cent. These variations, particularly in respect of fat content, have been the general experience for many years, the fat content usually being at its lowest in the spring and at its highest in the autumn. Solids-not-fat tend to be lower in the early months of the year.

The Average Composition of Morning and Evening Milk during the Year.

Usually, when samples are submitted, the information is given whether they are morning or evening milks. It has, therefore, been possible to classify them so as to show the average composition of morning and evening milks separately.

When cows are milked at the usual intervals the evening milk, due to the shorter interval, is richer in fat than the morning milk, while there is little if any difference as a rule in solids-not-fat. This is illustrated in table 16 below, where the average fat for morning milk is 3·57 per cent., and the evening fat 3·94 per cent. ; the fat in the evening milk being greater by 0·37 per cent., while the averages for solids-not-fat are almost identical for the morning and evening milk.

Table 16.

The Average Composition of Morning and Evening Milk during the Year.

	Number of Samples.*	Fat per cent.	Solids-not-fat per cent.	Total solids per cent.
Morning Milk...	1,252	3·57	8·65	12·22
Evening Milk	834	3·94	8·69	12·63
Mixed Milk ...	276	3·64	8·64	12·28
Unknown ...	3,324	3·65	8·66	12·31
Total ...	5,686	3·68	8·66	12·34

* Includes Appeal-to-Cow samples.

The Average Composition of Milk : compared with past years.

In table 17 the average composition of all the milks examined is set out for the period 1910-1955. It will be seen that the average figure for fat does not vary greatly from year to year. In respect of solids-not-fat there is very little difference in the averages for the years 1910-1940. Since 1940, however, it will be noted there is an appreciable decrease in solids-not-fat, the lowest figure of 8·55 per cent. being obtained in the year 1943. The average for solids-not-fat for the year under review was 8·66 per cent. In addition to other possible causes for this decrease it should be remembered, however, that seven of the 15 years during which the average solids-not-fat have been lower than formerly were years

which showed a high rate of adulteration. Since the year 1943 there has been a tendency for solids-not-fat to show an upward trend but they are still appreciably below the pre-war figures.

Table 17.

Average Composition of Milk, 1910–1955.

Year.	Number of Samples.	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
1910 to 1930 ...	56,028	3·67	8·90	12·57
1931	3,090	3·84	8·81	12·65
1932	3,205	3·77	8·85	12·62
1933	3,060	3·76	8·82	12·58
1934	3,310	3·74	8·81	12·55
1935	3,422	3·75	8·84	12·59
1936	3,098	3·73	8·88	12·61
1937	3,278	3·74	8·84	12·58
1938	3,398	3·70	8·78	12·48
1939	3,128	3·67	8·78	12·45
1940	2,144	3·70	8·79	12·49
1941	1,866	3·70	8·64	12·34
1942	1,516	3·75	8·66	12·41
1943	1,489	3·70	8·55	12·25
1944	1,197	3·69	8·57	12·26
1945	1,096	3·72	8·57	12·29
1946	2,776	3·75	8·58	12·33
1947	4,625	3·75	8·63	12·38
1948	4,523	3·67	8·64	12·31
1949	5,210	3·66	8·65	12·31
1950	5,362	3·68	8·67	12·35
1951	5,839	3·67	8·65	12·32
1952	5,844	3·67	8·68	12·35
1953	5,922	3·68	8·68	12·36
1954	5,182	3·71	8·65	12·36
1955	5,686	3·68	8·66	12·34
1910 to 1955 ...	145,294	3·72	8·84	12·56

Composition of Milk ; the County compared with Other Areas.

In table 18 below, figures are given for the composition of milk during the year 1955 in the areas of 12 other Food and Drugs Authorities. The corresponding figures for the County of Lancaster, based upon 5,686 samples of milk, are fat 3·68 per cent., solids-not-fat 8·66 per cent., and total solids 12·34 per cent. These last figures for both fat and solids-not-fat are within 0·1 per cent. of the averages of those included in the table.

Table 18.

Composition of Milk, 1955. Various Districts.

Area.	Number of Samples.	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
Somersetshire County	1,698	3·86	8·83	12·69
Staffordshire, County	4,022	3·62	8·65	12·27
Surrey, County ...	1,063	3·90	8·88	12·78
Worcestershire, County	3,988	3·74	8·68	12·42
Birmingham	2,885	3·67	8·69	12·36
Bristol	497	3·77	8·82	12·59
Leeds	2,555	3·66	8·71	12·37
Leicester	2,064	3·80	8·77	12·57
Liverpool	2,800	3·63	8·68	12·31
Manchester	1,319	3·49	8·71	12·20
Portsmouth	706	3·92	8·71	12·63
Salford	874	3·58	8·69	12·27

The Composition of Milk : Frequencies.

The 5,686 samples of milk reported upon during the year have been arranged in table 19 to show the number of samples having the same percentage of fat, or, in other words, the frequency with which each percentage of fat, differing by 0·1 per cent., occurred. The table has been shortened by placing in separate groups all samples containing less than 2·5 per cent. and above 3·9 per cent. This information is given for the whole year and for each month of the year.

This table gives different information than do figures for averages. It shows that, as in previous years, there are comparatively few samples below 3·0 per cent. It also shows how the figures from which the averages are calculated are distributed, information which is not obtainable from the figures for averages alone.

In this table, and the following one, table 20, all samples of milk are included, whether adulterated or not, and also all appeal-to-cow samples.

Table 19.

Composition of Milk: Frequencies.

FAT.

Per cent.	NUMBER OF SAMPLES.												
	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Under2·5	1	1	1	2	10	5	3	0	2	1	2	0	28
2·5	0	0	0	1	3	1	0	0	0	0	0	0	5
2·6	1	1	1	1	4	4	2	0	1	0	0	0	15
2·7	0	2	4	5	11	2	2	1	0	1	2	0	30
2·8	1	1	4	1	9	5	3	5	5	1	0	0	35
2·9	5	5	3	4	6	9	8	4	3	1	1	0	49
3·0	14	9	13	12	24	14	25	5	7	1	2	2	128
3·1	12	14	12	15	15	23	9	6	5	12	8	4	135
3·2	12	22	16	21	30	29	20	19	6	6	7	5	193
3·3	28	46	28	39	29	72	28	20	6	7	12	9	324
3·4	47	47	53	68	80	104	53	45	13	16	17	12	555
3·5	90	85	115	97	101	83	94	95	24	18	30	20	852
3·6	108	137	120	72	59	37	43	85	70	21	28	35	815
3·7	84	55	63	21	34	14	27	27	102	50	66	77	620
3·8	42	39	35	12	19	17	13	13	80	120	117	65	572
3·9	21	20	22	14	23	10	10	8	22	117	80	55	402
4·0 and over	89	65	63	49	80	49	63	40	74	129	168	59	928
Totals ..	555	549	553	434	537	478	403	373	420	501	540	343	5686

Table 20 gives the frequencies for solids-not-fat. It has already been stated that the average figure for solids-not-fat for the year was 8·66 per cent., and the bulk of the individual figures for solids-not-fat are arranged closely around the average.

Table 20.

Composition of Milk : Frequencies.

SOLIDS-NOT-FAT.

Per cent.	Number of Samples.												
	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Under7·8	1	1	7	0	3	2	0	1	3	1	2	0	21
7·8	1	1	0	0	0	0	1	0	1	0	0	0	4
7·9	2	1	2	4	1	0	3	0	0	0	0	1	14
8·0	5	3	4	3	0	4	1	0	1	1	0	0	22
8·1	3	10	8	7	1	3	2	2	2	0	0	1	39
8·2	7	12	14	13	7	3	5	3	4	1	0	3	72
8·3	22	30	24	25	11	9	8	13	9	2	0	7	160
8·4	38	32	23	42	17	7	13	20	8	6	6	9	221
8·5	155	152	110	154	81	36	67	109	57	19	25	46	1011
8·6	161	146	176	119	157	101	108	102	91	64	78	89	1392
8·7	88	93	103	32	138	157	105	77	91	128	170	101	1283
8·8	37	38	43	22	75	97	47	23	97	147	147	49	822
8·9	23	13	23	5	26	30	28	13	27	80	58	13	339
9·0 and over	12	17	16	8	20	29	15	10	29	52	54	24	286
Totals ..	555	549	553	434	537	478	403	373	420	501	540	343	5686

Samples of Milk taken for Comparison.

The Third Schedule of the Food and Drugs Act, 1938, contains certain provisions relating to the procuring of comparison samples of milk. Briefly, when a sample of milk is obtained from a vendor he is required to give the Sampling Officer the name and address of the person from whom he, in turn, received the milk. The vendor may also, within 60 hours of the sample being taken, serve on the Food and Drugs Authority a notice stating the name and address of the person from whom he received the milk and the time and place of delivery to himself of milk from a corresponding milking, and requesting the Authority to procure, as soon as practicable, a sample of milk from a corresponding milking in course of transit or delivery to himself. The vendor shall have no right to request such a sample if the original sample procured from him was a mixture of milk obtained from more than one person. In turn, the dairyman from whom such a sample of milk is procured in course of transit or delivery, may, within 60 hours after the sample was procured, serve on the Authority concerned a notice requesting that immediate steps be taken to procure a

sample of milk from a corresponding milking of the cows. The person procuring this last sample shall be empowered to take such steps at the dairy as may be necessary to satisfy him that the sample is a fair sample of the milk of the cows when properly and fully milked.

It is the practice in the County for the Sampling Officers to take, in appropriate cases, follow-up and appeal-to-cow samples without a formal request being made by the vendor. This involves a considerable amount of work both for the Sampling Officers and the Analyst. Sometimes both types of samples are obtained and as many as six and occasionally even 12 samples may be taken in connection with one unsatisfactory sample. It is thought desirable to undertake this large amount of work to ensure that everything possible is done to establish beyond all reasonable doubt that a sample is adulterated and not of naturally poor quality and, if adulterated, to obtain information indicating where the adulteration occurred before deciding whether legal proceedings should be instituted.

Appeal-to-Cow Samples.

Appeal-to-cow samples, or, as they are sometimes called, " byre " samples, if the method of taking them is properly carried out in every detail, may be regarded in the light of a final appeal. The milking must be carefully supervised, it must be established that the same cows are milked, that it is the corresponding milking and the dairy equipment must be inspected to see that it is clean and dry. The results of analysis of samples procured in this way must be accepted as those pertaining to genuine milk. Appeal-to-cow samples serve at least two purposes. In the first place, they show, in cases where an unsatisfactory sample has been sold, the quality of the unadulterated milk given by the cows, and, secondly, extend our knowledge of the quality of the milk of different herds and of the natural variations which may occur in the composition of genuine milk.

It was with the former object in view that the practice of taking appeal-to-cow samples was instituted, *viz.*, to ascertain the composition of the milk given by the cows. It is now generally admitted that the composition of the milk from a herd of cows may occasionally fall below the limits laid down in the Sale of Milk Regulations, particularly at the morning milking. When such a milk is examined the question arises whether it is an unadulterated milk of poor quality, or a milk of normal composition which has been tampered with ; the appeal-to-cow sample is intended to help to solve this problem.

In table 21 below, there is given a list of appeal-to-cow samples, submitted by County Sampling Officers during the year 1955, and also the results of analysis. Forty-nine such samples are included, representing 16 herds, the number of cows in the herds varying from four to 64.

In addition five appeal-to-cow samples were examined for autonomous authorities.

Table 21.

Analysis of Appeal-to-Cow Samples of Milk.

Number	Number of Cows Milked.	Approximate yield, gallons.	Morning or Evening.	Fat per cent.	Solids-not-fat per cent.	Freezing Point (Hortvet) °C.	Taken for comparison with number—	Observations.
534	9	9	M	4·30	8·70	—0·536	N.3236	
535	8	6	E	4·85	8·67	—0·544	N.3235	
536	24	11¼	E	4·62	8·70	—0·538	N.3405 and N.3406	
537		9¼		4·10	8·22	—0·535		Low in solids-not-fat.
S.4402	10	7½	E	3·75	8·19	—0·536	S.4401	Low in solids-not-fat.
S.4403	9	5½		3·45	8·13	—0·535		Low in solids-not-fat.
538				3·55	8·37	—0·540		Low in solids-not-fat.
539				3·25	8·55	—0·542		
540				3·30	8·56	—0·540		
541	44	66	M	3·35	8·51	—0·539	N.3713	
542				3·40	8·50	—0·538		
543				3·65	8·67	—0·538		
544				3·50	8·44	—0·539		Slightly low in solids-not-fat.
545				3·25	8·37	—0·538		Low in solids-not-fat.
546				1·75	8·11	—0·531		Poor in fat and low in solids-not-fat.
547				2·75	8·59	—0·532		Poor in fat.
548				2·35	8·39	—0·530		Poor in fat and low in solids-not-fat.
*549				3·20	7·28	—0·533		Low in solids-not-fat.
550				2·70	8·20	—0·531		Poor in fat and low in solids-not-fat.
*451	37	60 to 70	M	2·00	7 98	—0·523	N.3770	Poor in fat and low in solids-not-fat.
*452				1·65	7·51	—0·524		Poor in fat and low in solids-not-fat.
*453				2·60	8·74	—0·530		Poor in fat.
454				2·70	8·42	—0·531		Poor in fat and low in solids-not-fat.
*455				2·80	8·52	—0·530		Poor in fat.
456				2·70	8·54	—0·532		Poor in fat.
435	4	7	E	3·35	8·67	—0·540	C.3646	
364	4	10	M	2·75	8·53	—0·540	E.5028 and E.5029	Poor in fat.
365		9	E	2·60	8·60	—0·538		Poor in fat.
458	8	12	M	3·15	8·17	—0·539	N.3955	Low in solids-not-fat.
459				3·05	8·19	—0·537		Low in solids-not-fat.
460				3·05	8·23	—0·537		Low in solids-not-fat.
436	10	7½	E	3·45	8·61	—0·548	C.3819	

Table 21—continued.

Number	Number of Cows Milked.	Approximate yield, gallons.	Morning or Evening.	Fat per cent.	Solids-not-fat per cent.	Freezing Point (Hortvet) °C.	Taken for comparison with number—	Observations.
S.5165	4	5		2.05	8·27	—0·537		Poor in fat and low in solids-not-fat.
S.5166	4	6		2·10	8·90	—0·542		Poor in fat.
S.5167	4	5	M	2·65	8·43	—0·542	S.5142 and S.5143	Poor in fat and slightly low in solids-not-fat.
S.5168	4	6		3·55	8·37	—0·537		Low in solids-not-fat.
S.5169	2	2½		3·05	9·05	—0·545		
461		8¾		3·00	8·18	—0.543		Low in solids-not-fat.
462	17	9	M	3·70	8·56	—0·552	N.4122, N.4124 and N.4125	
563		10		3·95	8·88	—0·547		
366				4·10	8·80	—0·546		
367				4·70	8·60	—0·545		
368	64	55	E	4·45	8·65	—0·544	E.5353	
369				4·20	8·58	—0·544		
370				4·45	8·58	—0·545		
371				5·20	8·58	—0·544		
437	7	6½	E	5·10	8·82	—0·544	C.4182	
464	7	5	M	3·70	8·76	—0·542	N. 4575 and N.4576	
372	9	5	E	5·00	8·50	—0·540	E.6148	

* Milk from individual cows.

An inspection of table 21 shows that the freezing point depression of the appeal-to-cow samples was determined in every case, and this gave valuable evidence of the authenticity of the samples. Although, as indicated in the next paragraph, a number of the appeal-to-cow samples were naturally poor in solids-not-fat, with the exception of samples No's 451 and 452 which represented samples of milk from individual cows, in no other instance was the figure freezing point of the sample above —0·530°C. (Hortvet), the figure which is usually accepted as the highest freezing point given by milk free from extraneous water. Excluding samples No's 451 and 452 the freezing points of the 47 remaining samples varied between —0·530°C. to —0·552°C. (Hortvet); the average figure being —0·539°C. (Hortvet). The average freezing points of appeal-to-cow samples examined during the five preceding years were —0·539°C., —0·540°C., —·0540°C., 0·540°C. and —0·541°C.

A further examination of the results in table 21 makes it obvious that some of the samples did not attain the presumptive limits of 3·0 per cent. for fat and 8·5 per cent. for solids-not-fat laid down by the Sale of Milk Regulations, 1939. In this respect 15 samples contained less than 3·0 per cent. fat and 19 samples contained less than 8·5 per cent. solids-not-fat. It must be remembered, however, that the appeal-to-cow samples listed in the above table were all taken in connection with previous samples of milk which were either adulterated or of unsatisfactory quality; in other words, the high proportion of poor quality appeal-to-cow samples obtained is due to selective sampling and it cannot, therefore, be assumed that the results are indicative of the general quality of milk in Lancashire.

In tables 22 and 23 will be found the analytical results obtained in respect of the 49 appeal-to-cow samples, submitted by County Sampling Officers, arranged to show their frequencies in respect of fat content and solids-not-fat.

Table 22.

Appeal-to-Cow Samples.—Frequencies.

FAT.

Per cent.	Number of Samples.	Percentage of Total Samples.
1·6	1	2·0
1·7	1	2·0
2·0	2	4·1
2·1	1	2·0
2·3	1	2·0
2·6	3	6·2
2·7	5	10·3
2·8	1	2·0
3·0	4	8·2
3·1	1	2·0
3·2	3	6·2
3·3	3	6·2
3·4	3	6·2
3·5	3	6·2
3·6	1	2·0
3·7	3	6·2

Per cent.	Number of Samples.	Percentage of Total Samples.
3·9	1	2·0
4·1	2	4·1
4·2	1	2·0
4·3	1	2·0
4·4	2	4·1
4·6	1	2·0
4·7	1	2·0
4·8	1	2·0
5·0	1	2·0
5·1	1	2·0
5·2	1	2·0
Total ...	49	100·0

Table 23.

Appeal-to-Cow Samples.—Frequencies.

SOLIDS-NOT-FAT.

Per cent.	Number of Samples.	Percentage of Total Samples.
7·2	1	2·0
7·5	1	2·0
7·9	1	2·0
8·1	6	12·2
8·2	4	8·2
8·3	4	8·2
8·4	3	6·2
8·5	13	26·6
8·6	7	14·2
8·7	4	8·2
8·8	3	6·2
8·9	1	2·0
9·0	1	2·0
Total	49	100·0

Milk Supplied to Schools, Day Nurseries, Children's Homes and Hostels for the Aged.

The 308 samples of milk marked " Private " in table 3 were taken from consignments delivered to Schools, Day Nurseries, Children's Homes and Hostels for the Aged in the County. Fourteen of these samples were adulterated, corresponding to an adulteration rate of 4·5 per cent. This figure is very slightly lower than the total milk adulteration rate for the County which was 4·8 per cent.

Of the 308 samples 282 were taken at schools. Thirteen of these were found to be adulterated or otherwise unsatisfactory. Repeat samples taken in respect of five of these samples were found to be satisfactory. Seven samples showed only slight fat deficiencies and the respective vendors were notified of the results. The remaining sample, which showed a small fat deficiency but contained extraneous water, was followed up by two formal samples No's N.4575 and N.4576 both of which, on examination, were found to be seriously deficient in fat and to contain large amounts of extraneous water. Legal proceedings were instituted against the vendor who was fined £5 together with £5 5s. costs.

Fifteen samples were taken at Day Nurseries and, of these, one was found to contain visible dirt. The vendor was cautioned and a follow-up sample was found to be satisfactory. In addition two samples were taken at Children's Homes and nine at Hostels for the Aged, all of which were found to be genuine.

Samples of Milk deficient in solids-not-fat but genuine.

Attention has already been drawn, in the sections of this Report dealing with the " Standards of quality for milk " and " appeal-to-cow " samples, to the fact that milk as it comes from the cow is not always of such quality as to comply with the minimum presumptive limits of 3·0 per cent. for milk-fat and 8·5 per cent. for solids-not-fat, of the Sale of Milk Regulations, 1939. In order to decide whether such samples submitted under the Food and Drugs Act were in fact as given by the cow, and therefore, genuine, it is still necessary in the case of presumed fat deficiencies to make an actual comparison with an " appeal-to-cow " sample from a corresponding milking. Formerly, this was also the only means by which it could be decided whether a sample low in solids-not-fat was of naturally poor quality or whether it had been adulterated by the addition of water. For the past 25 years or so, however, it has been possible by submitting the sample to the Hortvet freezing point test for the Analyst to obtain additional evidence that a deficiency in solids-not-fat was due to the presence of extraneous water or, alternatively, that it was due to natural causes.

In the section of the revised Ministry of Health memorandum 36/Foods (1939), dealing with Public Analysts' quarterly reports, it is laid down that in the case of samples below the presumptive limits of the Sale of Milk Regulations, the report should show whether they were adjudged genuine by the Analyst on other grounds. It is now the normal procedure to submit all samples low in solids-not-fat to the Hortvet freezing point test and to include in the quarterly reports a table giving details of such samples which satisfactorily pass the test.

During the year under review, 369 samples of milk were found to be poor in solids-not-fat, but were adjudged genuine by the Hortvet freezing point test. This figure corresponds to 6·5 per cent. of the total milk samples (including appeal-to-cow) submitted by County Sampling Officers. These poor quality milks were distributed over the year as follows:—164 in the March quarter, 119 in the June quarter, 64 in the September quarter and 22 in the December quarter. The samples were not, therefore, confined to any particular season of the year, although the greatest number was obtained towards the end of the winter and the lowest towards the end of summer. The lowest figure for solids-not-fat shown by any of these samples was 7·28 per cent., the next lowest being 7·35 per cent.

Each year it is usual to find an appreciable number of milk samples which are poor in solids-not-fat but are nevertheless adjudged genuine as the result of applying the Hortvet freezing point test. The number of such samples, *viz.*, 6·5 per cent., submitted during the year under review is lower by 0·2 per cent. than for the year 1954, when the figure was 6·7 per cent. In the five years preceding the year 1954 the percentage of milk samples coming under this heading varied from 3·8 to 7·9 per cent.

Adulteration of Articles other than Milk.

During the year under review there were examined for the County 2,736 samples other than milk; of these 140 were reported against, which corresponds to an adulteration rate of 5·1 per cent., which is higher than the figure obtained in the year 1954, when it was 4·4 per cent. The percentage of adulteration in articles other than milk for the year under review, was slightly higher than that for milk, *viz.*, 4·8 per cent. An examination of tables 3 and 24 shows that the commodities which had a relatively high proportion of unsatisfactory samples, and, therefore, contributed especially to the overall adulteration rate, included ice-cream, sausages, orange drinks, ammoniated tincture of quinine and samples whose labels did not conform to the requirements of the Labelling of Food Order.

Table 24 gives a list of the articles other than milk submitted by County Sampling Officers which were found to be unsatisfactory with particulars of the type of adulteration and the action taken.

Table 24.

Samples, other than Milk, Adulterated or otherwise giving rise to Irregularity.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
N.3014 ..	Lard ..	Informal	Consisted of Compound Cooking fat	Vendor interviewed.
N.3017 ..	Pork Sausages ..	Informal	Meat content only 58 per cent.	Vendor interviewed.
C.2735 ..	Ammoniated Tincture of Quinine ..	Informal	Deficient 0·1 per cent. of the minimum amount of ammonia	Remainder of stock returned to manufacturers.
C.2744 ..	Plain Flour ..	Informal	Creta Praeparata only 5·5 ounces per 280 lbs. sack. Should be 14 ounces per sack. Vitamin B1 only 0·16 milligrams per 100 grams. Should be 0·24 milligrams. Iron only 1·12 milligrams per 100 grams. Should be 1·65 milligrams.	Remainder of stock returned to manufacturers. Ministry of Food notified.
N.3051 ..	Apples ..	Informal	Contained Lead 3·7 parts per million and Arsenic 2·7 parts per million	Wholesaler and vendor communicated with.
C.2788 ..	Ammoniated Tincture of Quinine ..	Informal	Deficient of 0·19 per cent. of the minimum amount of ammonia	Vendor communicated with re storage.
N.3134 ..	Penicillin Tablets ..	Informal	Contained 60,000 units of Penicillin per tablet. Declared 100,000 units per tablet	See N.3230.
S.3903 ..	Vinegar ..	Informal	Total mineral matter 0·74 per cent. including salt 0·65 per cent. Salt not declared in list of ingredients	Packers agreed to alter label.
N.3154 ..	Treacle ..	Informal	Contained Copper 52 parts per million. Recommended limit 20 parts per million	Packers undertook to prevent a recurrence in future.
C.2894 ..	Pork Sausages ..	Informal	Meat content 63·5 per cent.	No action advised.
N.3175 ..	Ammoniated Tincture of Quinine ..	Informal	Deficient of 0·14 per cent. of the minimum amount of ammonia	Stock replaced. Vendor undertook to prevent a recurrence in future.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.4220 ..	Beef Sausages ..	Informal	Contained 290 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor interviewed. Further sample genuine.
E.4222 ..	Margarine ..	Informal	Butter content only 6·0 per cent. Declared 10·0 per cent.	Formal sample genuine. Packers undertook to prevent a recurrence in future.
C.2934 ..	Pork Sausages ..	Informal	Meat content only 58 per cent.	Vendor interviewed.
C.2997 ..	Non-Brewed Condiment ..	Informal	Label stated " Non-Brewed Condiment " " Aligar." Word " Aligar " suggests a brewed product	Packers agreed to delete the word " Aligar " from labels.
N.3229 ..	Penicillin Tablets ..	Informal	Contained only 145,000 units of Penicillin per tablet. Declared 200,000 units per tablet	See N.3314.
N.3230 ..	Penicillin Tablets ..	Informal	Contained only 40,000 units of Penicillin per tablet. Declared 100,000 units per tablet	Stock withdrawn from sale. Same vendor as N.3134.
E.4268 ..	Beef Sausages ..	Informal	Meat content only 46·5 per cent.	Vendor interviewed. See No. E.4987.
E.4312 ..	Jersey Milk ..	Formal	Deficient 7·2 per cent. solids-not-fat ; freezing point indicated 13·2 per cent. extraneous water	Food and Drugs Act, 1938 Section 83 (1). Fined £3 and £4 4s. costs.
N.3276 ..	Ammoniated Tincture of Quinine	Informal	Deficient of 0·35 per cent. of the minimum amount of ammonia	Stock withdrawn from sale.
C.2992 ..	Cherry Ginger Concentrate ..	Informal	Contained 950 parts per million Methyl Hydroxy-benzoic Acid. This substance is not a permitted preservative	Packers cautioned. Stock withdrawn from sale.
S.4114 ..	Salt ..	Informal	Contained 5·9 per cent. moisture. Appearance of having been stored under damp conditions	Old packet. Remainder of stock satisfactory.
N.3314 ..	Penicillin Tablets ..	Informal	Contained only 142,000 units of penicillin per tablet. Declared 200,000 units per tablet	Stock withdrawn from sale and destroyed. Vendor undertook to prevent a similar occurrence in future.
C.3076 ..	Lard ..	Informal	Contained Hydrogenated fat	Vendor interviewed and cautioned. Further sample genuine.
E.4424 ..	Flour ..	Informal	Contained only 2·8 ounces of Creta Praeparata per 280 lbs. and only 0·05 milli grams of Vitamin B1 per 100 grams.	Ministry of Food informed.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.4474 ..	Molasses ..	Informal	Claims the presence of essential elements without disclosure of the nature and minimum amounts of those present	Packers agreed to alter label.
N.3887 ..	Pepper .. Compound	Private (School)	Contained two dead beetles (probably Ptinus Tectus) and five dead ants	No further stock available Supplies now obtained from different vendor.
N.3393 ..	Aspirin .. Tablets	Informal	Contained 0·07 per cent. free salicylic acid in excess of B.P. limit	Stock withdrawn from sale.
S.4253 ..	Orange .. Drink	Informal	Labelled "——Orange." Should be labelled " Orange Drink—ready for use."	Vendor communicated with.
E.4525 ..	Ammoniated .. Tincture of Quinine	Informal	Deficient of 0·08 per cent. of the minimum amount of ammonia	Packers proposed to use only screw capped small sized bottled in future.
C.3183 ..	Whisky ..	Formal	Contained 3·5 per cent. excess water	Vendor cautioned.
E.4559 ..	Ammoniated Tincture of Quinine	Informal	Deficient of 0·14 per cent. of the minimum amount of ammonia	Vendor communicated with. No further stock.
E.4560 ..	Glauber's .. Salt	Informal	Loss at 105°C. only 41·5 per cent.	No action advised.
E.4557 ..	Glauber's .. Salt	Informal	Conforms to requirements of Exsiccated Glauber's Salt B.P.C.	Vendor interviewed.
E.4614 ..	Ammoniated Tincture of Quinine	Informal	Deficient of 0·46 per cent. of the minimum amount of ammonia	Vendor communicated with. No further stock available.
C.3265 ..	Brisling in .. Tomato, Canned	Private (Day Nursery)	Tin blown and contents contained 310 parts per million of tin	Remainder of stock destroyed.
E.4675 ..	Camphorated Oil	Informal	Contained 21·6 per cent. Camphor. Maximum B.P. limit is 21·0 per cent. Camphor	Remainder of stock returned to suppliers.
N.3541 ..	Tea .. Extender	Informal	List of ingredients included a phrase that was not a specific description as required by paragraph 4 (3) (ii.) of the Labelling of Food Order	Packers agreed to alter label.
E.4704 ..	Ice-Cream .. Cold Mix	Informal	List of ingredients on the label in wrong order	Old stock. Correct labels now in use.
C.3406 ..	Pork .. Sausages	Informal	Meat content only 52·5 per cent.	See No. C.3482.
C.3408 ..	Ice-Cream ..	Informal	Contained only 3·9 per cent. fat and 4·6 per cent. milk solids other than fat	See No. C.3594.

Table 24—continued.

No. of. Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
C.3445 ..	Glycerin ..	Informal	Contained 0·1 per cent. excess water	No action advised.
C.3448 ..	Sago ..	Informal	Consisted of Tapioca with a trace of Rice	Vendor interviewed.
N.3589 ..	Ice-Cream ..	Informal	Contained only 4·2 per cent. fat	See No. N.3719.
E.4777 ..	Tincture of Iodine ..	Informal	Contained Iodine 0·05 per cent. and Potassium Iodide 0·09 per cent. above maximum B.P. limits	No action advised.
E.4799 ..	Tincture of Iodine ..	Informal	Iodine 0·27 per cent. and Potassium Iodide 0·55 per cent. below minimum B.P. limits respectively	Vendor interviewed. Stock withdrawn from sale.
C.3471 ..	Channel Islands Milk ..	Formal	Fat content only 3·65 per cent.	Ministry of Food informed.
C.3482 ..	Pork Sausages ..	Formal	Deficient of 32 per cent. of the minimum percentage of meat	Section 3 Food and Drugs Act, 1938. Fined £2 and £4 4s. costs.
S.4665 ..	Pork Sausages ..	Informal	Meat content only 53·5 per cent.	Vendor and manufacturer interviewed and cautioned.
N.3719 ..	Ice-Cream ..	Informal	Contained only 4·4 per cent. fat	Vendor interviewed. Further sample genuine.
E.4924 ..	Glycerin ..	Informal	Contained 2·4 parts per million Arsenic *i.e.*, 0·4 part per million above B.P. limit	No action advised.
E.4718 ..	Orange Drink ..	Informal	Contained broken glass 0·3 gram.	Packers cautioned.
N.3758 ..	Sago ..	Informal	Consisted of Tapioca	Vendor interviewed.
N.3765 ..	Tincture of Iodine ..	Informal	Iodine 2·47 per cent. Potassium Iodide 2·52 per cent. Contents of bottle conformed to B.P. 1953 yet label stated "B.P. 1932"	Manufacturers agreed to alter label.
C.3594 ..	Ice-Cream ..	Formal	Deficient of 18 per cent. of the minimum percentage of fat and 68 per cent. of the minimum percentage of milk solids other than fat	Food Standards (General Provisions) Order, 1944, Article 1. Fined £3 3s. and £5 15s. 6d. Costs.
N.3804 ..	Ice-Cream ..	Informal	Contained only 3·7 per cent. fat	Formal sample genuine.
S.4835 ..	Meat and Potato Pie, Canned ..	Informal	Beef, Flour and Potato in incorrect order in list of ingredients	Further sample genuine.
E.4971 ..	Channel Islands Milk ..	Formal	Fat content only 3·20 per cent.	Ministry of Food informed.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.4980 ..	Channel Islands Milk ..	Formal	Fat content only 3·65 per cent.	Ministry of Food informed.
E.4987 ..	Beef Sausages ..	Informal	Contained 165 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor interviewed.
S.2940 ..	Sliced 2 lb. white Loaf ..	Informal	Loaf contained a dark stain ½-in. by 3/16-in. consisting of used lubricating oil or grease	Vendor interviewed and cautioned.
E.5012 ..	Pork Sausages ..	Informal	Meat content 64 per cent.	No action advised.
C.3681 ..	Plain Flour ..	Informal	Contained only 2½ ounces of creta praeparata per 280 lb. and only 1·25 mgms of iron and 0·15 mgms of vitamin B1 per 100 gms.	Ministry of Food informed.
N.3870 ..	Milk Bread ..	Informal	Milk powder absent ..	Vendor interviewed. Sold as Milk Bread in error.
E.5041 ..	Teething Powders ..	Informal	Each powder contained approximately 35 mgms of mercurous chloride	Old stock. Manufacturers no longer making this commodity. Remaining stock withdrawn from sale.
E.5042 ..	Glycerin B.P. ..	Informal	Contained 0·2 per cent. excess water	No action advised.
N.3895 ..	Whisky ..	Formal	Contained 18·1 per cent. excess of water	Section 3 Food and Drugs Act, 1938. Fined £10 and £4 4s. costs.
E.5072 ..	Pork Sausages ..	Informal	Meat content only 60 per cent.	Vendor interviewed. See E.6062.
C.3724 ..	Flour ..	Informal	Contained only 3 ounces of creta praeparata per 280 lbs.	Ministry of Food informed.
N.3963 ..	Channel Islands Milk ..	Formal	Fat content 3·95 per cent.	No action advised.
N.3970 ..	Potato Crisps, etc.	Informal	Printing on label unsatisfactory and list of ingredients in wrong order	Packers agreed to alter labels.
E.5124 ..	Sago ..	Informal	Consisted of Tapioca	Vendor communicated with.
E.5149 ..	Beef Sausages	Informal	Meat content 48·5 per cent.	No action advised.
E.5150 ..	Pork Sausages ..	Informal	Meat content only 60·5 per cent.	Vendor interviewed.
N.4012 ..	Teething Powders ..	Informal	Each powder contained approximately 42 mgms. of mercurous chloride	Remainder of stock withdrawn from sale.

Table 24 continued.

No. of Sample.	Description.	Formal, Informal, or Private.	Nature of Adulteration or Irregularity.	Observations.
E.5211 ..	Channel Islands Milk ..	Formal	Fat content only 3·85 per cent.	Ministry of Agriculture, Fisheries and Food informed.
N.4019 ..	Ice-Cream ..	Informal	Fat content 4·5 per cent. Milk solids other than fat 7·2 per cent.	See No. N.4155.
S.5092 ..	Channel Islands Milk ..	Formal	Fat content only 3·8 per cent.	Ministry of Agriculture, Fisheries and Food informed.
E.5179 ..	Channel Islands Milk ..	Formal	Fat content only 3·85 per cent.	Ministry of Agriculture, Fisheries and Food informed.
N.4096 ..	Orange Drink ..	Informal	No name of food or name and address of packer on bottle or cap	Packers communicated with.
N.4118 ..	Ice-Cream, Cold Mix ..	Informal	List of ingredients on the label in wrong order	Manufacturers undertook to replace stock held under the old label.
N.4119 ..	Rum Butter ..	Informal	No list of ingredients, net weight or name and address of packer on label	Old stock. Correct labels. now in u e.
N.4137 ..	Tapioca ..	Informal	Consisted of Sago	Sold as Tapioca in error.
N.4155 ..	Ice-Cream ..	Informal	Milk solids other than fat 6·5 per cent.	Further sample genuine.
E.5292 ..	Orange Juice ..	Informal	Contained only 9·4 per cent. Orange (including juice)	See No. E.5298.
E.5298 ..	Orange Juice ..	Formal	Consisted of a soft drink containing only 10 per cent. Orange (including juice)	Defence (Sale of Food) Regulations, 1943 1 (1). Fined £5 and £1 1s. costs.
E.5343 ..	Tapioca ..	Informal	Consisted of Sago	Vendor notified.
E.5346 ..	Tapioca ..	Informal	Sample contained 15 per cent. of mouldy and damaged grains	Stock surrendered and destroyed.
C.3962 ..	Ice-Cream ..	Informal	Fat content 3·7 per cent.	Vendor interviewed. Further sample genuine.
C.3961 ..	Ice-Cream ..	Informal	Milk solids other than fat 6·5 per cent.	Vendor interviewed. Further sample genuine.
E.5387 ..	Tapioca ..	Informal	Consisted of Sago	Packers notified.
C.3997 ..	Ice-Cream ..	Informal	Fat content 4·6 per cent.	Vendor interviewed. Further sample genuine.
E.5412 ..	Double Orange ..	Informal	Labelled "Double Orange." Should be followed by the word "Drink" and then the words "ready for use." The label also described the beverage as a "Sparkling Drink." This description should only apply to a carbonated beverage and not to a still drink of this type	Manufacturers agreed to amend label.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
C.4018 ..	Ice-Cream ..	Informal	Milk solids other than fat 7·1 per cent.	Vendor interviewed. Further sample genuine.
C.4019 ..	Ice-Cream ..	Informal	Fat content 3·5 per cent. Milk solids other than fat 7·1 per cent.	Formal sample genuine.
N.4209 ..	Orange Drink ..	Informal	No name of the food on the label	Packers agreed to label this commodity correctly.
N.4258 ..	Ice-Cream ..	Informal	Fat content only 4·1 per cent.	Vendor cautioned. Further sample genuine.
E.5494 ..	Borax B.P. ..	Informal	Borax by B.P. Assay 106·5 per cent. B.P. maximum limit 103·0 per cent.	Packers communicated with. Old stock . No further stock remaining.
C.4119 ..	Lemon Cheese ..	Informal	Soluble solids 62·8 per cent. Deficient 2·2 per cent. soluble solids	Manufacturers took steps to prevent a recurrence of this deficiency in future.
C.4131 ..	Lemon Flavouring ..	Informal	No name and address of packer on label	Origin of sample not known. No further stock available.
N.4360 ..	Beef Sausages	Informal	Contained 200 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor interviewed.
C.4201 ..	Orange Drink ..	Informal	No name of the food on the label	Vendor interviewed.
N.4380 ..	Beef Sausages ..	Informal	Contained 170 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor interviewed.
C.4232 ..	Milk, Condensed, Full Cream Unsweetened ..	Informal	The prescribed declaration was not in block type of the required height	Same vendor. Advised vendor be interviewed. See No. C.4365.
C.4233 ..	Milk, Condensed, Full Cream, Unsweetened ..	Informal	The prescribed declaration was not in block type of the required height	
C.4324 ..	Milk, Condensed, Full Cream, Unsweetened ..	Informal	The prescribed declaration was not in block type of the required height	
C.4235 ..	Milk, Condensed, Full Cream Unsweetened ..	Informal	The prescribed declaration was not in block type of the required height	
N.4418 ..	Pork Sausages ..	Informal	Meat content only 46 per cent. and contained 55 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	See No. N.4533.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
C.4262 ..	Beef Sausages ..	Informal	Contained 260 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor interviewed.
E.5692 ..	Soup, Canned ..	Informal	Contained 310 parts per million tin and no declaration of ingredients on the label	Stock surrendered and destroyed.
N.4438 ..	Beef Sausages ..	Informal	Meat content 49 per cent.	No action advised.
E.5729 ..	Bacon ..	Informal	Odour and Chemical tests indicate incipient putrefaction	Stock withdrawn from sale.
N.4473 ..	Tincture of Iodine ..	Informal	Iodine 0·32 per cent. and potassium iodide 0·43 per cent. above maximum B.P. limit. Contents of bottle had partially leaked out	Further sample genuine.
N.4469 ..	Beef Sausages ..	Informal	Contained 45 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor interviewed.
C.4328 ..	Beef Sausages ..	Informal	Contained 270 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor interviewed.
C.4335 ..	Ground Almonds ..	Informal	Acid value of Oil 17. Sample also had sour taste and odour	No further stock available Sample from new stock genuine.
E.5769 ..	Curry Powder ..	Informal	Contained lead 13 parts per million and copper 35 parts per million	Packers communicated with.
N.4533 ..	Pork Sausages ..	Formal	Deficient of 33 per cent. of the minimum percentage of meat	Section 3 Food and Drugs Act, 1938. Fined £3 and £6 6s. costs.
C.4365 ..	Evaporated Milk (Full Cream unsweetened) ..	Formal	Declaration on label not in the form prescribed in that it was not in block type and was in letters of only one-sixteenth of an inch in height	Prosecution not proceeded with.
N.4552 ..	Gin ..	Formal	Contained 5·2 per cent. excess of water	Section 3 Food and Drugs Act, 1938. Fined £2 and £5 5s. costs.
E.5876 ..	Pork Sausages ..	Informal	Meat content only 50·5 per cent	See No. E.5975.
S.5732 ..	Sponge Cake and Sponge Pudding Mixture, sweetened ..	Informal	Contained some dead acari insect excreta	See No S.5759.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
S.5734 ..	Sponge Cake and Sponge Pudding Mixture, unsweetened ..	Informal	Infested with live acari	Stock surrendered for destruction.
S.5759 ..	Sponge Cake and Sponge Pudding Mixture, sweetened ..	Informal	Sample "caked" and some dead acari and insect excreta present. Available carbon dioxide only 0·17 per cent.	Stock surrendered for destruction.
E.5948 ..	Iodine, Tincture of ..	Informal	Iodine 0·05 per cent. above maximum B.P. limit	No action advised.
E.5964 ..	Iodine, Tincture of ..	Informal	Iodine 0·15 per cent. above maximum B.P. limit	Existing stocks being withdrawn from sale.
E.5966 ..	Pork Sausages ..	Informal	Meat content 59 per cent.	Vendor interviewed.
E.5975 ..	Pork Sausages ..	Formal	Meat content 55 per cent.	Vendor cautioned.
S.5816 ..	Margarine ..	Informal	Butter fat not more than 2 per cent.	See No. S.5842.
S.5842 ..	Margarine ..	Formal	Deficient of at least 80 per cent. of the declared percentage of butter	Vendor cautioned.
E.5998 ..	Baby Food ..	Informal	Amounts of Vitamin B1 and B2 insufficient to justify claim of their presence. Amount of iron should be declared and not stated as "a trace." Vitamin C found only 6 mgms. per ounce.	Old stock Correct labels now in use.
N.4750 ..	Blackcurrant Drink ..	Informal	Labelled simply "Blackcurrant" with an incomplete name of packer	Packers agreed to alter label.
C.4610 ..	Beef Sausage Meat ..	Informal	Contained 55 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor interviewed.
C.4621 ..	Pork Sausages ..	Informal	Contained 310 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor interviewed.
S.5905 ..	Cut Mixed Peel ..	Informal	Contradictory declaration of order of ingredients on outer and inner wrappings	Packers agreed to alter label.
N.4756 ..	Channel Islands Milk ..	Formal	Fat content only 3·5 per cent. Freezing point indicated 0·9 per cent. extraneous water	Ministry of Agriculture, Fisheries and Food informed re fat deficiency and vendor cautioned re extraneous water.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.6062 ..	Pork .. Sausages	Informal	Meat content 62·5 per cent.	No action advised.
S.5949 ..	Table Jelly .. Crystals with Fruit Juices	Informal	Fruit juice content in finished jelly table sweet not more than 0·3 per cent.	Packers agreed to alter labels.
N.4835 ..	Orange .. Drink	Informal	No name of the food except the word " Orange " and an incomplete name and address of packers. Orange content only 4 per cent.	Packers agreed to alter label.
N.4811 ..	Olive Oil ..	Informal	Sample did not comply with B.P. test for absence of arachis oil. Arachis oil 15 per cent.	Remaining stock withdrawn from sale.

The Labelling of Food Order.

The first Labelling of Food Order was made in the year 1944 but it has been amended or re-enacted on several occasions since that time. The Order at present in operation is the Labelling of Food Order, 1953, which came into operation on the 5th April of that year. Only one amendment to the Order was made during the year 1955 and this, as already indicated at the beginning of this report, keeps in operation, with modifications, certain of the requirements of Sections 32 and 33 of the Food and Drugs Act, 1938, with regard to the labelling of margarine and margarine-cheese. Sections 32 and 33 of the 1938 Act were, of course, repealed on the 1st January, 1956.

During the year under review 29 samples (20 County and nine from Autonomous Authorities) were found to contravene the requirements of the Labelling of Food Order. Brief details of the 20 County samples will be found in table 24. Of the total number of samples to which exception was taken 25 (17 County) had labels which did not disclose one or more of the following requirements ; the name and address of the packer, the true name of the food or a correct list of ingredients. In each of the above instances the packers were communicated with and their attention drawn to the requirements of the Order. During the year 1954 the number of County samples which contravened the Labelling of Food Order was exactly the same (20) but the number of Autonomous Authority samples coming under this heading was then 26 as against nine in the year under review. The number of unsatisfactorily labelled orange, etc., drinks sold ready for consumption in one-third pint bottles submitted by County Sampling Officers is still relatively high ; seven unsatisfactory County samples of this type and one unsatisfactory sample

from an Autonomous Authority were received in 1955 as against 12 unsatisfactory County samples and 12 unsatisfactory samples from Autonomous Authorities in the year 1954. The question of fruit drinks is discussed further in the section of this report which deals with soft drinks. In the following paragraphs reference is made to four of the more interesting samples, in relation to their labels, submitted by County Sampling Officers.

Non-Brewed Condiment, Sample No. C.2997.

The label on this informal sample bore the words " Non-Brewed Condiment," " Aligar " and " solution of acetic acid and caramel." Upon analysis it was found to contain 4·6 per cent. of acetic acid and its oxidation and iodine values were negligible indicating that it was a non-brewed product. The word " Aligar " could, however, be extremely misleading in that it is synonymous with the word " Alegar " or " Aliger " which means sour ale or vinegar made from it. Aligar is, therefore, a fermented or brewed product and the use on a label of the expression " non-brewed condiment " and the word " aligar " to describe one product is clearly contradictory. The packers of this commodity were communicated with and they agreed to delete the word " aligar " from their labels.

Tea Extender, Sample No. N.3541.

The ingredients of this sample were claimed to be " Dextrin, tannin, the essential ingredients of tea, slight additive colouring with Orange Pekoe flavour." Upon analysis the following figures were obtained : dextrin 53·5 per cent., tannin 44 per cent., and caffeine 1 per cent. Paragraph 4 (3) (ii.) of the Labelling of Food Order, 1953, requires the description given to each ingredient or constituent of a food to be specific and to indicate its true nature. The expression " the essential ingredients of tea " included in the list of ingredients of this sample was too vague, in the opinion of your Analyst, to comply with the above requirement, particularly as claims were also made for the presence of at least one specific ingredient of tea. The firm concerned were communicated with and they agreed to substitute, for the expression complained of, the words " water soluble extractives of Tea " when new labels were printed.

Molasses, Sample No. E.4474.

The tin in which this informal sample was submitted bore on the label the following statement : " A safe investment in good health. Unsuitable or deficient diet causes many complaints and diseases. Crude sugar cane molasses supplies those essential elements which the average diet may lack." No indication was given on the label as to the specific names

of the essential elements nor were any quantitative particulars given of the minimum amounts present. In view of this omission the label did not, in the opinion of your Analyst, comply with Part VI. of the Labelling of Food Order, 1953, which lays down special labelling requirements where the presence of vitamins or minerals or tonic properties are claimed. The importers of this product were communicated with and a very lengthy correspondence ensued. The packers at first proposed to substitute for the last sentence of the paragraph quoted the words " enrich your diet with pure cane sugar Molasses," at the same time leaving in the reference to unsuitable or deficient diet. It was pointed out that the proposed amendment still contained a general claim of the presence of substances, such as vitamins or minerals, which would make up for a deficiency in diet. Any general claim of this nature could be held to be an infringement of the Labelling of Food Order unless the minimum quantities of the vitamins or minerals present were also specified on the label. The importers eventually instructed their packers to omit from the label all reference to diet deficiency or enrichment or to the use of molasses in this connection. It is interesting to note that eight other samples of molasses, including one from the same packers as Sample No. E.4474 were examined during the year 1955 and none of these bore any claims as to the presence of elements or minerals.

Baby Food, Sample No. E.5998.

The ingredients of this sample were stated to be : invert sugar, concentrated orange juice, vitaminised vegetable oil, lactose, sodium bicarbonate, sodium citrate, yeast extract, calcium glycerophosphate and iron. The presence of nine vitamins and minerals were also claimed including : Vitamin B1 0·0017 mgm. per ounce, Vitamin B2 0·0045 mgm. per ounce, Vitamin C 9·0 mgms. per ounce and iron " a trace." The amounts actually found to be present were Vitamin B1 0·004 mgm. per ounce, Vitamin C 6·0 mgms. per ounce and iron 2·0 mgms. per ounce. In the suggested Code of Practice for claims regarding vitamin and mineral constituents published by the Ministry of Food as a Press Notice in 1945, the adult daily requirement of Vitamin B1 is stated to be equivalent to 0·9 mgm. per ounce, Vitamin B2 1·8 mgms. per ounce, Vitamin C 30 mgms. per ounce and Iron 10 mgms. per ounce. The Code of Practice also stated that no claim was justified unless the amount of the food that would ordinarily be consumed in one day contained at least one-sixth of the daily requirement of the vitamin or mineral. Having regard to the weight of an infant as compared with an adult and the level of feeding recommended on the label it was calculated that the amounts of Vitamins B1 and B2 present were insufficient to justify a claim of their presence, while the amounts of Vitamin C and Iron would substantiate such a

claim. The packers were communicated with to this effect, at the same time it was pointed out that the amount of Vitamin C found was less than that declared and the amount of iron present in relation to the daily requirement justified a specific quantitative statement rather than a mere reference to the presence of a trace. It transpired that the sample submitted was very old stock and that the label complained of had been withdrawn in the year 1951 ; the label at present in use makes no claim at all with regard to Vitamins B1 and B2 or Iron. The age of Sample No. E.5998 was also suggested as being the probable reason for the deficiency in Vitamin C. In view of this very old stock having come to light the packers stated that they were instituting a system of marking this product with an expiry date.

Ice-Cream.

The first Standards Order for ice-cream was made in March, 1951, but due to shortages of fats and milk powder it was soon found impossible to maintain the standards then formulated without reducing supplies of ice-cream. The Minister of Food, therefore, introduced, as a temporary measure, reduced standards for fat and milk solids other than fat in July, 1952. During the year 1953, however, the supply position improved again and the Food Standards (Ice-Cream) Order, 1953, which came into operation on the 1st June, 1953, restored the original standards fixed in the year 1951. It should be remembered that even these standards are not ideal and when they were originally recommended by the Food Standards Committee of the Ministry of Food the Committee considered that the standards should be amended and progressively improved as supplies of ingredients became more plentiful. Furthermore, the Committee considered that the description " ice-cream " should eventually be restricted to a dairy product containing a high proportion of milk solids.

The present standard for ice-cream contained in the Schedule to the 1953 Order is as follows :—

" 1. Ice-cream shall contain not less than five per cent. fat, 10 per cent. sugar and 7½ per cent. milk solids other than fat :

Provided that—

(i.) ice-cream containing any fruit, fruit pulp or fruit puree shall either conform to the standard set forth above or, alternatively, the total content of fat, sugar and milk solids other than fat shall be not less than 25 per cent. of the ice-cream including the fruit, fruit pulp or fruit puree, as the case may be, and such total content of fat, sugar and milk solids other than fat shall include not less than 7½ per cent. fat, 10 per cent. sugar and two per cent. milk solids other than fat :

(ii.) 'Parev' (kosher) ice sold, offered or exposed for sale under that description shall contain not less than 10 per cent. fat and not less than 14 per cent. sugar, and the standard for ice-cream set forth above shall not apply to this product.

"2. For the purpose of the standards prescribed above 'sugar' means sucrose, invert sugar or the solids of any sweetening material derived from starch so however that no ice-cream shall contain less than 7½ per cent. sucrose.

"3. Each reference in this Schedule to any proportion or percentage means that proportion or percentage by weight."

It should be noted that notwithstanding a decrease in the average fat content of ice-cream during the year under review compared with the previous five years the improvement in the fat content of ice-cream found over the last seven years, is still being maintained. A persual of table 25 shows that the average fat content in 1946 was only 2·3 per cent. whereas in 1954 it was 9·2 per cent. and in the year under review 8·1 per cent. Furthermore, the lowest fat content during 1954 was 3·1 per cent. and in 1955, 3·5 per cent.; whereas in the four years 1946 to 1949 fats as low as 0·3 and even 0·1 per cent. were found.

The average fat content of ice-cream has increased in striking manner since 1946, but the increases noted since 1948 were, in the first place, due to the action of the Ministry of Food in allocating from November, 1948, additional supplies of sugar and in certain cases fats to those ice-cream manufacturers who, at that time, undertook to include at least 2·5 per cent. fat in their ice-cream. This step to increase the quality of ice-cream was taken more than two years before the first statutory standard for ice-cream was made.

During the year 1955, 95 samples of ice-cream were submitted for chemical analysis, 55 by County Sampling Officers and 40 by Autonomous Food and Drugs Authorities. Although no harmful ingredients were found in any of the samples, 15 (13 County and two from Autonomous Authorities) did not comply with the Food Standards (Ice-Cream) Order. In the year 1954 nine samples were reported upon adversely. Of the 13 unsatisfactory County samples, six were deficient in fat, four deficient in fat and milk solids other than fat and three deficient in milk solids other than fat. In the case of the two unsatisfactory samples from Autonomous Authorities one was deficient in sugar and one was slightly deficient in milk solids other than fat. Successful legal proceedings were instituted in respect of one sample, No. C.3594, seriously deficient in fat and milk solids other than fat which was submitted by a County Sampling Officer. Details of the incorrect County samples, together with the action taken, will be found in table 24.

The average figures found for the 95 samples were—total solids 33·2 per cent. (maximum 40·9 ; minimum 24·3) and for fat content 8·1 per cent. (maximum 13·3 ; minimum 3·5). These figures, as will be seen from the following table, which includes figures for the last 10 years, show that the big improvement noted in the year 1950 has been maintained. It will be remembered that prior to the war a figure of eight per cent. was suggested by a trade association as a minimum standard for fat content and it is interesting to note that during the year under review, 46 samples out of the total of 95 showed fat contents varying from 8·1 per cent. to 13·3 per cent.

Table 25.

Ice-Cream.

Year.	Number of Samples	Fat Content Average %	Total Solids Average %	Highest Fat %	Lowest Fat %	Highest Total Solids %	Lowest Total Solids %
1946 ...	45	2·3	22·5	10·7	0·1	36·8	13·3
1947 ...	59	3·0	23·6	10·6	Less than 0·1	39·2	14·1
1948 ...	53	3·9	25·3	11·3	0·1	33·4	18·9
1949 ...	171	6·4	29·3	13·3	0·3	45·9	14·7
1950 ...	186	8·5	32·1	14·7	2·2	43·0	20·1
1951 ...	230	8·6	32·6	15·6	3·3	40·7	23·0
1952 ...	143	9·0	32·8	13·7	2·0	40·0	19·6
1953 ...	130	8·6	32·7	15·2	2·5	42·3	23·3
1954 ...	90	9·2	34·6	13·8	3·1	44·0	24·8
1955 ...	95	8·1	33·2	13·3	3·5	40·9	24·3

Ice Lollies.

During the year under review 24 samples of ice lollies were submitted for examination under the Food and Drugs Acts. Twelve of the samples were submitted by County Sampling Officers, the remaining 12 samples all being from one Autonomous Food and Drugs Authority. Unlike ice-creams there is no statutory standard for the composition of ice lollies. They are specifically excluded from the provisions of the Food Standards (Ice Cream) Order while the Food Standards (Soft Drinks) Order refers

only to liquid soft drinks although ice lollies are, in general, similar in composition to soft drinks. Ice lollies and ice-cream are, however, both specifically mentioned in the revised reports on lead and arsenic of the Food Standards Committee of the Ministry of Food which were published in the years 1954 and 1955 respectively. In these reports maximum limits of 1 part per million for lead and 0·5 part per million for arsenic (as As) are recommended for both types of commodities. The limits for the majority of other foods being two parts per million and one part per million respectively.

In only one instance out of the 24 samples examined was an excessive amount of any toxic metal found ; furthermore, in the case of wrapped ice lollies, there was no instance of failure to comply with the Labelling of Food Order. In addition to the recommended limits for lead and arsenic referred to above there are also recommended maximum limits for two other toxic metals, *viz.*, copper 20 parts per million and zinc 50 parts per million. The one sample which was reported upon adversely was submitted by an Autonomous Food and Drugs Authority and upon analysis it was found to contain, lead eight parts per million and copper 54 parts per million, both these results being substantially above the recommended maximum limits for the respective metals. The presence of traces of copper in excess of the recommended limit, while certainly undesirable, cannot be regarded as seriously as would an excess of arsenic or lead, particularly having regard to the cumulative effect of the last mentioned metal. The manufacturer of the unsatisfactory sample was interviewed and he agreed at once to scrap the moulds in which he was making the ice lollies and replace them with new moulds. A sample taken subsequently from this source was found to be perfectly satisfactory.

The total solids (sugars, etc.) in the samples ranged from as little as 1·1 per cent. to 24·6 per cent. with an average for the 24 samples of 9·5 per cent. The average total solids on 30 samples examined in the previous year was 10·2 per cent. while the range of total solids obtained in the years 1952, 1953 and 1954 were very similar to the figures given above for the year under review. Five samples showed fat contents varying from 1·6 to 3·3 per cent. but in respect of two of these no claim was made that either milk or ice-cream was present. Of the remaining three samples one was described as an ice-cream lolly and the other two claimed non-fatty milk solids and fat in the list of ingredients. The amounts of milk solids other than fat in these three samples varied from 1·3 per cent. to 3·8 per cent.

Sausage, Meat Paste and Fish Paste.

On the 1st March, 1953, the last of the Meat Products Orders was revoked and this had the effect of removing all restrictions, for control purposes, on the price and composition of both pork and beef sausages.

It should be noted, however, that the Orders mentioned above were made by the Minister of Food for the purpose of controlling the sale of certain commodities which were, or had been, in short supply. Foods and drugs must, in addition, satisfy the requirements of the Food and Drugs Acts. Under section 3 of the 1938 Act a food or drug sold to a purchaser must be of the nature, substance or quality of the article demanded; if no Statutory Standard exists under the Act for the particular article in question a prosecution may still be instituted in respect of a sample regarded as unsatisfactory and the Court itself must then fix a standard based on the evidence before it. Even in the days of Ministry of Food control it was always necessary, in prosecutions by Food and Drugs Authorities in connection with samples of sausage alleged to be deficient in meat, for the Court to fix its own standard (because the standard made by the Minister of Food was not made under the Food and Drugs Acts) although in so doing the Court would have regard to the standard then in operation for commodity control purposes. In view of the increasing supplies of meat available it would appear reasonable to expect that sausages should now have at least the same meat content as in the days of control and short supply and two successful prosecutions (both County) were instituted during the year 1955, in respect of samples of pork sausage which were seriously deficient in meat. In these cases the Courts accepted the opinion of your Analyst that genuine pork sausage contains not less than 65 per cent. of meat.

The Meat Products Orders, in addition to controlling price and meat content, also prohibited the use of certain specified offals in the preparation of sausages and other uncooked open meat products intended for human consumption. The restriction on the use of these offals has been re-enacted in the Offals in Meat Products Order, 1953, which came into operation on the 1st March, 1953, and this Order also provides that proceedings for an infringement may be brought by a Food and Drugs Authority without the consent of the Minister of Food.

The compositions of meat paste and of fish paste are controlled by the Food Standards (Meat Paste) Order, 1951, and the Food Standards (Fish Paste) Order, 1951. The standard for meat paste is a minimum of 55 per cent. meat and for fish paste a minimum of 70 per cent. fish. The standards apply to both imported and home produced products.

During the year 1955, 119 samples of sausage, three of sausage meat, two of Cumberland sausage and three of canned sausage were examined as against 132 samples of sausage, two of sausage meat and one of cocktail sausages in the previous year. Eighty-two samples were examined for the County (including three sausage meat, two canned sausages and one Cumberland sausage) and 45 (including one Cumberland sausage and one canned sausage) for Autonomous Food and Drugs Authorities; of these

27 County and 13 submitted by other Food and Drugs Authorities were reported upon adversely. Of the 40 samples reported as not satisfactory two samples of pork sausage seriously deficient in meat were submitted by County Sampling Officers and were the subject of successful prosecutions ; a perusal of table 24 will show, however, that many of the unsatisfactory County samples were only slightly deficient in meat. Of the total number of sausage samples submitted during the year under review, 57 (including one sausage meat) consisted of beef and 65 of pork (including two sausage meat). Fifteen of the samples (10 County) examined contained normal amounts of suphite preservative but without any declaration of the presence of preservative being exhibited in the shops concerned. This is contrary to the requirements of the Public Health (Preservatives, etc., in Food) Regulations, 1925–1953. In addition, two samples of beef sausage in respect of which preservatives were declared (submitted by an Autonomous Authority) both contained excess suphite preservative ; above the maximum permitted limit of 450 parts per million by 210 and 60 parts per million respectively. These two samples were obtained from the same shop and were informal and formal samples respectively taken within 24 hours of each other ; the vendor was subsequently cautioned. Details of all the adulterated County samples, together with the action taken, will be found in table 24.

It is interesting to note that the average meat content of 56 samples of beef sausage examined in the County Laboratory during the year 1955 was 61·7 per cent. Similarly, the average meat content of 63 samples of pork sausage (including seven samples which were seriously deficient in meat) examined over the same period was 65·7 per cent. Bearing in mind that the standards before the 1st March, 1953, under the Commodity Control Order were a minimum of 50 per cent. meat for beef sausage and beef sausage meat and a minimum of 65 per cent. meat for pork sausage and pork sausage meat, the average figure obtained in the County Laboratory during the year 1955 for beef sausages is very satisfactory. In fact of 56 samples of beef sausage only five contained less than 50 per cent. meat. With regard to pork sausage the average results are also satisfactory and there is an improvement on the results obtained in the previous year. It may be remembered that the average meat content for 69 samples submitted during the year 1954 was 0·5 per cent. below 65 per cent. and this included only six seriously deficient samples. Of the 63 samples of pork sausages submitted during the year 1955, 15 contained less than 65 per cent. meat but it should, as already mentioned, be noted that this figure only includes seven samples seriously deficient. Although this cannot be regarded as satisfactory it must be emphasised that it cannot be assumed that the position with regard to pork sausage has deteriorated since control was removed at the beginning of the year 1953. Fifty per cent. of the pork sausage samples submitted

in each of the years 1951, 1952 and 1953 were reported upon adversely and the proportion of unsatisfactory samples for the year 1954 was 39 per cent. The proportion of unsatisfactory pork sausages examined during the year under review was 24 per cent., *i.e.* less than in the previous four years. The Minister of Agriculture, Fisheries and Food is keeping the question of the meat content of sausages under constant review and for that purpose Public Analysts are giving particulars in their quarterly reports of the price and meat content of all samples of sausages analysed by them.

Seventeen samples of meat paste (15 submitted by County Sampling Officers and two by Autonomous Authorities) were examined during the year. All the samples were found to be satisfactory.

With regard to fish paste, 27 samples (20 County) were submitted for examination during the year 1955 and these samples were also found to be satisfactory.

Fresh Fruit.

In the report for the year 1954, attention was directed in some detail to the necessity which now exists for examining fresh fruit for added chemicals. This arises mainly from the extensive use of insecticidal sprays by growers and of anti-mould agents by packers for the purpose of ensuring better crops and the marketing of sound produce. It is one of the duties of the Public Analyst to see that no harmful quantity of any chemical residue remains on fruit or other food when it is offered for sale and that existing regulations are complied with, in particular, the Public Health (Preservatives, etc., in Food) Regulations and the Mineral Oil in Food Order. With this in view the staff of the County Laboratory during the year under review has continued to examine samples of apples, etc., for excessive amounts of lead and arsenic which might arise from the use of lead arsenate sprays and samples of citrus fruits for thiourea, diphenyl, boron preservative and mineral oil.

During the year 1955, 37 samples of fresh fruit were examined in the County Laboratory, of these 34 were submitted by the County Sampling Officers and three by an Autonomous Food and Drugs Authority. The samples consisted of the following varieties of fruit : 15 Apples, 16 Oranges, two Lemons, one Grapefruit, one Pears, one Peaches and one Tangerines. Of these samples one County sample was reported upon adversely. Sample No. N.3051, Apples, contained on their skins amounts of lead and arsenic in excess of the normal permitted limits. The amount of lead found was 3·7 parts per million and the amount of arsenic 2·7 parts per million. Unfortunately it was found impossible to trace the importers with a view to bringing the matter to the notice of the Port Health Authority and the Ministry of Agriculture, Fisheries and Food but both the shopkeeper and wholesaler were notified of the results.

Soft Drinks.

In December of the year 1953 most of the controls previously exercised by the Minister of Food in respect of soft drinks were revoked. The Standards for soft drinks, however, which were previously incorporated in the Soft Drinks Order, 1947, were continued with minor alterations in the Food Standards (Soft Drinks) Order, which came into operation on the same date that the other controls ceased. There were no amendments to the Standards Order during the year 1955.

The Food Standards (Soft Drinks) Order, 1953, incorporated the following provisions which were previously covered by licences issued by the Ministry of Food: medicated drinks conspicuously and properly labelled as such and glucose beverages which contain not less than 23 per cent. weight in volume of liquid glucose, or alternatively not less than 10 per cent. weight in volume of dextrose monohydrate, are exempt from the standards prescribed in the Order. Soft drinks clearly labelled that they are intended for consumption by diabetics are also exempt from the standards in so far as sugar and saccharin content are concerned. Ginger beer and other herbal beers are included in the standards but allowance may be made for any loss in sugar content due to brewing. Specific references to non-alcoholic wine, non-alcoholic cider and non-alcoholic perry do not appear in the Standards Order but these presumably are covered by the general heading " Any other description of soft drink containing fruit juice."

Drinks made from whole fresh oranges are described as such in the Standards Order and not as " squash made from whole fresh oranges " which was the previous description. In this connection, it should be noted that the standard for these drinks requires them to be made from not less than 27½ lbs. comminuted entire fresh oranges per 10 gallons (*i.e.* 27½ per cent. weight in volume) in the case of drinks requiring dilution and from not less than 5½ lbs. of comminuted entire fresh oranges per 10 gallons (*i.e.* 5½ per cent. weight in volume) in the case of drinks ready for consumption; as prepared for consumption they are, therefore, fruit drinks made from something over 5½ per cent. of whole orange but it would be incorrect to describe them as orange juice or to expect that they could contain the vitamin " C " content of fresh undiluted orange juice. It is important to note that the Standards Order does not say that these drinks must " contain " the specified amounts of whole orange but only that they must be " made from " these quantities—there can be quite a difference in the composition of the final product depending on whether or not the interpretation of the phrase " made from " is taken literally, particularly as in some methods of manufacture a relatively large proportion of the insoluble portion of the orange appears to be discarded.

During the year 1954 further exemptions from the provisions of the Standards Order were introduced by the Food Standards (Soft Drinks) (Amendment) Order, 1954, which came into operation on the 22nd August, 1954. Prior to that date fruit juice was only exempted from the requirements of the Standards Order when in a pure undiluted condition ; this exemption has now been extended to include all undiluted fruit juice, with or without added sugar, and any such juice in a concentrated (or frozen) form.

During the year 1955, 63 samples of soft drinks have been examined including 18 samples submitted from Autonomous Food and Drugs Authorities. The total number of samples under this heading submitted during the previous year was 94. Included in the total for the year under review were 18 samples of various types of mineral waters, 19 samples of concentrated soft drinks (squash, etc.), 23 samples of orange and other fruit drinks in one-third pint bottles, one glucose drink and two non-alcoholic wines.

Of the above samples 11 (nine County and two submitted by Autonomous Authorities) were reported upon adversely. An informal County sample of Cherry Ginger Concentrate contained 950 parts per million of methyl hydroxybenzoate. This substance is not a permitted preservative in foods but is used as a preservative for pharmaceutical preparations and it is the subject of a monograph in the British Pharmaceutical Codex. It transpired that the manufacturers of this product also make pharmaceutical preparations and because of this a mistake had arisen. The remainder of the stock concerned was withdrawn from sale. In the case of a County sample of Orange Drink in a one-third pint bottle, three fragments of broken glass, weighing in all 0·3 gram, were found to be present and the packers were cautioned. Two samples of Whole Orange Drinks, one County sample of a drink sold diluted ready for consumption in a one-third pint bottle and a sample, submitted by an Autonomous Food and Drugs Authority, of a drink requiring dilution, were found upon analysis to contain four and 18 per cent. of Orange respectively as compared with the requirements of the Food Standards (Soft Drinks) Order that they should be made from 5½ per cent. and 27½ per cent. of comminuted entire fresh orange respectively. The packers of both these drinks were communicated with and their attention drawn to the discrepancy between the amount of orange actually present as compared with the amount of orange from which they were required to be made. The label on another sample of orange drink in a one-third pint bottle described it as a " Sparkling Drink " although this description should only be applied to a carbonated beverage and not to a still drink of this type ; the manufacturers agreed to amend this label. Objection was also taken to the labels on eight samples of fruit drink (seven orange and one

pineapple), which number includes two of the samples already referred to as unsatisfactory for other reasons. These were sold diluted ready for consumption in one-third pint bottles and seven of them were submitted by County Sampling Officers. They all failed, in the opinion of your Analyst, to comply with the requirements of the Labelling of Food Order in respect of the name given to the drink or by the omission of the name and address of the packer. There are three alternatives for orange drinks ready for consumption ; firstly, as already indicated, the Food Standards (Soft Drinks) Order provided for a drink made from not less than 5½ per cent. of whole fresh orange, secondly, the same Order provides for a drink containing not less than 5 per cent. of orange juice, lastly, pure undiluted orange juice may be marketed. It is obviously important that a purchaser should be left in no doubt as to which of these he is being offered and the Labelling of Food Order does, in fact, require the packer to apply a correct label to the food. In the above instances the labels bore either no name or such descriptions as " Orange," or " Double Orange " ; descriptions which in no way indicate to a purchaser which of the three types of orange drink is being offered to him ; the position being aggravated in that in some instances the roundsmen delivering the drinks referred to them verbally to their customers as bottles of " orange juice " or " fruit juice." The packers of each of these samples were communicated with and informed of the requirements of the Labelling of Food Order. As a result of the unsatisfactory position regarding drinks in one-third pint bottles which has developed following the addition of drinks made from comminuted entire fresh oranges to the list of permitted soft drinks in the year 1951, the Public Health and Housing Committee in October, 1954, resolved to refer the matter to the County Councils Association with a view to representations being made to the Minister for an amendment of the appropriate Order to require a specific statement of the nature of the various orange drinks to appear on the label and to require a minimum orange or orange juice content to be present in the drink and also declared on the label. No such amendment has yet been made but it is understood that the matter is still actively under consideration.

Although fruit juices do not come within the provisions of the Food Standards (Soft Drinks) Order it is convenient to mention them here because two of the samples submitted as samples of fruit juice were found upon analysis to consist only of soft drinks containing a relatively small proportion of actual fruit juice. The total number of samples submitted under the description of fruit juice was 16 (12 County). These included eight Lemon Juice, four Orange Juice, one Pineapple Juice, one Blackcurrant Juice, one Apple Juice and one Tomato Juice. Three samples were reported upon adversely. An informal sample of Blackcurrant Juice submitted by an Autonomous Food and Drugs Authority

bore on the label a declaration that the contents contained not more than 0·35 per cent. sulphur dioxide. The actual sulphur dioxide content was 245 parts per million and the declaration was obviously a printer's error for 0·035 per cent. The packers agreed to amend the label. The other two unsatisfactory samples were informal and formal samples respectively of the same commodity which was labelled and sold as " orange juice " in one-third pint bottles. Both samples were submitted by a County Sampling Officer and upon analysis they were found to consist simply of soft drinks containing only 9·4 per cent. and 10 per cent. respectively of orange (including juice). Successful legal proceedings were instituted in respect of the formal sample, No. E.5298, under the Defence (Sale of Food) Regulations, 1943.

Table Jellies.

The composition of table jellies is controlled by the Food Standards (Table Jellies) Order, 1949. This Order prescribes standards of composition for three types of manufacturered jellies, *viz.*, table jelly tablets, table jelly crystals and table jelly compounds. The purpose of the Order was to give statutory effect to requirements as to composition which had previously been incorporated in manufacturing licences issued under the Manufactured and Pre-packed Foods (Control) Order, 1942, now revoked. The Standards Order also provides that all three types of manufactured jellies, when made into a jelly table sweet, shall set satisfactorily under the conditions of the setting test which is incorporated in the Schedule of the Order.

The standard for table jelly tablets requires that they shall consist of sugar, gelatine or other jelly forming material (other than farinaceous products) with other ingredients (not being farinaceous products) in tablet form. The percentage of soluble solids (determined by refractometer at 20°C.) shall not be less than 72 per cent. and the percentage of total sugar (sucrose plus total reducing sugars as dextrose) shall not be less than 63 per cent.

In the case of table jelly crystals the same ingredients are prescribed made up in crystal form and the percentage of total sugars must not be less than 84 per cent.

Table jelly compounds must contain similar ingredients, not excluding farinaceous products, and must satisfy the setting test when made into a jelly table sweet with milk. The compound must contain not less than 50 per cent. of total sugars and the starch content, if any, must not exceed 20 per cent.

There has only been one amendment to the Standards Order since it was originally made and that is contained in the Food Standards (Table Jellies) (Amendment) Order, 1955, which came into operation on the 16th June of the year under review. The amending Order permits the finished table jelly sweet, made in the specified manner from table jelly crystals, to contain not less than two and a half ounces of sugar per pint as an alternative to the requirement in the 1949 Order that the jelly crystals must contain not less than 84 per cent. of sugar. This amendment has the effect of providing for the use of low setting gelatine in the manufacture of table jelly crystals and brings the Food Standards (Table Jellies) Order in line with the Food Standards (Edible Gelatine) Order, 1951. The last mentioned Order permits the sale of low setting strength gelatine for human consumption provided that it is clearly labelled as such and the label includes directions which will enable a jelly to be made from it which will satisfy the prescribed setting test.

During the year under review 51 samples of table jellies were submitted for examination, 42 by County Sampling Officers and nine by Autonomous Food and Drugs Authorities. The samples included 43 table jelly tablets, seven table jelly crystals and one table jelly compound. Of the total number of samples only one, a sample of table jelly crystals, was reported upon adversely. This sample, No. S.5949, complied with the requirements of the Food Standards (Table Jellies) Order but a claim was made on the label with regard to the presence of real fruit juices which was not justified, in the opinion of your Analyst, by the amount of fruit juice which was actually present. The following words appeared on the label " contains a concentration of real fruit juices " and " taste the fruit—the real fruit." Upon analysis it was found that the amount of fruit juice present amounted to not more than 0·3 per cent. in the finished jelly table sweet prepared as directed. Judged by the amounts of fruit juice required to be present in certain other commodities in which its presence is claimed, the amount found in this particular sample could by no means be regarded as sufficient to warrant the claim made. The manufacturers of this product were interviewed and they agreed to amend future labels to read " contains the real flavour of the fruit " and " taste the real fruit flavour."

Margarine.

Margarine was derationed on the 8th May, 1954, and following that two important changes were made in its composition. The first is that two months after rationing ceased margarine was no longer permitted to contain boron preservative. This followed from the amendment introduced in clause 2 (e) of the Public Health (Preservatives, etc., in Food)

(Amendment) Regulations, 1953. The second change in composition was due to the making of the Food Standards (Margarine) Order, 1954, which came into operation on the 16th May, 1954. The Order applies only in respect of sales by retail and to both imported and home-produced margarine. A sale by retail includes a sale of margarine as such by a caterer but does not include a sale to a caterer for the purpose of his catering business or a sale to a manufacturer for the purpose of his manufacturing business. The standard prescribed by the Order is given in the First Schedule and refers to Vitamin A and Vitamin D content of margarine and is as follows :—

" Each ounce of margarine shall contain—

(*a*) not less than 760 international units and not more than 940 international units of vitamin A determined in accordance with the method set forth in the Second Schedule to this Order. The vitamin A content shall be calculated as the sum of the vitamin A present as such or as its esters plus 0·8 times the beta-carotene equivalent of any carotenes present ; any alpha-carotene being considered as equivalent in potency to half its weight of beta-carotene ; and when red palm oil is used as a source of carotenes, the beta-carotene equivalent shall be taken as 53·5 per cent. of the total carotenes ;

(*b*) not less than 80 international units and not more than 100 international units of vitamin D."

The amount of vitamin D now required to be present is approximately the same as that previously required to be present (90 i.u. per ounce) under the terms of manufacturing licenses in the days of control but the amount of vitamin A now prescribed is higher than in the days of control when it was limited to 450 to 550 i.u., per ounce. The present standard has resulted in the vitamin A content of margarine being raised to the average vitamin A content of butter.

The Standards Order not only prescribes the standard but it also, in the Second Schedule, prescribes the method by which the vitamin A content is to be determined and calculated. The method laid down is quite intricate and it will be sufficient to state here that it depends on the separation of carotene (pro-vitamin A) and vitamin A in the unsaponifiable matter of the margarine by a process of double column chromatography. The optical density of the carotene solution is measured in a spectrophotometer over the wavelengths 440 to 450 m.u., while the optical density of that portion of the eluate containing the vitamin A (which is identified colorimetrically by the Carr–Price reaction) is measured at the wavelength showing maximum absorption which is usually at 324 m.u. The total vitamin A potency of the margarine is then obtained from the sum of the B-carotene equivalent multiplied by 0.8 plus the actual vitamin A present

(calculated on the basis that a one per cent. solution of pure vitamin A alcohol in a one c.m. cell has a density of 1,830 at the wavelength of maximum absorption).

In view of the fact that the determination of vitamin D can, as yet, only be satisfactorily carried out by a very time-consuming and expensive biological assay no method for its determination has been included in the Order. Agreement has been reached, however, between the Ministry of Food and manufacturers in this country that the vitamins will be added to margarine through the medium of a master mix in which the proportions of vitamins A and D are in the ratio of 940 : 100. A satisfactory vitamin A determination will, therefore, also be indicative of the presence of the correct amount of vitamin D.

It should also be mentioned that in common with the procedure for other Food Standards Orders legal proceedings may now be instituted by Food and Drugs Authorities in respect of samples of margarine deficient in vitamins without the consent of the Minister of Food. Prior to the making of the Food Standards (Margarine) Order control of the vitamin content of margarine was exercised solely by the Ministry of Food in that inclusion of specified amounts of vitamins A and D was a condition of the issue of a manufacturing licence.

During the year 1955 legislation with regard to margarine was further amended, as indicated at the beginning of this report, in that the Food Standards (Butter and Margarine) Regulations, 1955, and the Labelling of Food (Amendment) Regulations, 1955, govern from the 1st January, 1956, the Standards for moisture and butter content and the labelling requirements for margarine. The Standards prescribed are similar to those which were previously prescribed under Section 32 of the Food and Drugs Act, 1938, but the labelling requirements of Section 33 of that Act have been modified and in some respects made less restrictive than formerly. The maximum limit for water content of margarine is, of course, the same as the limit for water in butter, *viz.*, 16 per cent., but, in addition, both the 1938 Act and the new Regulations prohibit the presence of more than 10 per cent. of fat derived from milk in the fat content of margarine. Furthermore, any claim that margarine contains butter must be accompanied by a statement of the percentage of butter present but no offence is deemed to have been committed if the figure stated does not differ by more than two from the actual percentage of butter present. The provision that not more than 10 per cent. of milk-fat shall be present in margarine is made under the new Standards Regulations while the tolerance of two per cent. in respect of claims of the presence of butter is made under the new Labelling Regulations ; it follows, therefore, that if 10 per cent. butter is claimed, the tolerance of two per cent. in this instance, strictly speaking, cannot operate to allow

12 per cent. to be actually present. The sale of margarine containing butter was reintroduced after rationing ceased in May, 1954, and this type of margarine is now quite commonly sold. It is interesting to note that, in your Analyst's experience, where a claim of the presence of butter is made it is invariably a claim for the maximum butter content permitted, *i.e.*, 10 per cent.

During the year under review a total of 93 samples of margarine were submitted for examination, 68 by County Sampling Officers and 25 by Autonomous Food and Drugs Authorities. Of these, 33 samples (21 County and 12 from Autonomous Food and Drugs Authorities) were examined for their Vitamin A content by the prescribed method. In respect of 40 of the samples (33 County and seven from Autonomous Food and Drugs Authorities) claims were made of the presence of 10 per cent. of butter and the butter content of each of these samples was determined. Five samples in all were reported upon adversely, including three County samples. Informal County sample No. E.4222 of imported margarine was found to contain only 6 per cent. butter against a claim of the presence of 10 per cent. butter. A formal sample from the same source was, however, satisfactory and the packers were informed of the results obtained on the informal sample, they undertook to take steps to prevent any recurrence of a deficiency in butter content in future. Informal sample No. S.5816, also of imported margarine but from another source of manufacture, was found to contain not more than 2 per cent. of butter although the presence of 10 per cent. was claimed. A formal sample No. S.5842 was obtained from the same consignment at the retail shop and this also only contained 2 per cent. of butter. In view of the very serious deficiency in butter content compared with the declaration it was considered that the results of the analysis would justify the institution of legal proceedings but, in view of the fact that other previous samples of this brand had been satisfactory and also the fact that being an imported product it would not be possible to proceed against the actual packer, it was ultimately decided to issue a caution. Of the two unsatisfactory samples submitted by Autonomous Food and Drugs Authorities one contained an excess of butter, *viz.*, 13·3 per cent. against a declaration of 10 per cent., and the importers of this product were communicated with. The remaining unsatisfactory sample, submitted by another Autonomous Food and Drugs Authority, showed indications of oxidative rancidity and the remainder of the retailer's stock was surrendered for destruction.

Spirits.

These are grouped together because whisky, rum, gin and brandy are required to conform to the same minimum standard for alcohol content. Section 4 (6) of the Food and Drugs Act, 1938, which relates

to defences available in proceedings in respect of the sale of any food or drug not of the nature or substance or quality demanded, reads :—

> " Where the proceedings are in respect of diluted whisky, brandy, rum or gin, that the spirit in question had been diluted with water only and that its strength was still not lower than 35° under proof."

Section 3 (4) of the Food and Drugs Act, 1955, which now replaces the above sub-section is almost identical in its phrasing.

During the year under review 77 samples of spirits were examined in the County Laboratory. These consisted of 48 samples of whisky, 11 of gin, 14 of rum and four of brandy. Of the total number of samples received 51 were submitted by County Sampling Officers and 26 were from Autonomous Food and Drugs Authorities. Three of the County Samples were reported upon adversely but all the samples received from Autonomous Food and Drugs Authorities were satisfactory. A formal sample of whisky, No. C.3183, was found upon examination to be 37·3 degrees under proof and it, therefore, contained 3·5 per cent. excess of water. The vendor of this sample was cautioned. Another formal sample of whisky, No. N.3895, was found upon analysis to be 46·8 degrees under proof which corresponds to the presence of 18·1 per cent. excess of water. Legal proceedings were instituted against the vendor concerned who pleaded " guilty " at the hearing of the summons and was fined £10 together with £4 4s. costs. The remaining unsatisfactory sample was a formal sample of gin, No. N.4552, which was found upon analysis to be 38·4 degrees under proof and it, therefore, contained 5·2 per cent. excess of water. In this instance also legal proceedings were instituted and at the hearing of the case the defendant pleaded " guilty " and was fined £2 together with £5 5s. costs.

Penicillin Preparations.

Amorphous penicillin of the British Pharmacopoeia occurs as the calcium salt, the potassium salt or the sodium salt. It consists of a mixture of penicillins of which five predominate and of these Benzylpenicillin is the most important in that it is this form which is required to be dispensed or supplied when " Penicillin " is prescribed. Benzylpenicillin (Crystalline Penicillin G) is supplied as the crystalline potassium or sodium salt which has had impurities and salts of other penicillins removed as completely as possible. In addition to the above, a compound of Benzylpenicillin, *i.e.*, Procaine Benzylpenicillin is also included in the British Pharmacopoeia. This salt of penicillin is sparingly soluble and it is used when it is necessary to release penicillin slowly over a longer period than usual into the blood stream.

The official preparations of the British Pharmacopoeia which are made from either Amorphous Penicillin or Benzylpenicillin include a cream, an eye ointment, an injection, a lozenge and an ointment. Tablets are made only from Benzylpenicillin. The two preparations of Procaine Benzylpenicillin official in the British Pharmacopoeia are an injection and another injection containing both Procaine Benzylpenicillin and Benzylpenicillin. In addition to the above the British Pharmaceutical Codex lists solution-tablets containing either Amorphous Penicillin or Benzylpenicillin, a sterilised cream containing Benzylpenicillin and eye-drops of Benzylpenicillin.

The official assays of Benzylpenicillin are carried out by chemical methods but the determination of the potency of Amorphous Penicillin, Procaine Benzylpenicillin and certain of the preparations of penicillin is carried out by a micro-biological method using a susceptible strain of B. subtilis and comparing the dose of the sample with the dose of a standard preparation of penicillin which produces the same degree of inhibition of the micro-organism. The potency is returned in terms of units of penicillin. The unit at present in use being the specific activity contained in 0·0005988 mg. of the Standard Preparation of the dried crystalline sodium salt of Benzylpenicillin. The British Pharmacopoeia directs that penicillin and its water-free preparations should be stored in sealed or well-closed containers, protected from moisture and kept cool. Warning is given that the cream and injection of penicillin, which of course contain water, deteriorate rapidly in potency on keeping. The 1955 Addendum to the British Pharmacopoeia, 1953, has amended the storage requirement for tablets of penicillin so that it now reads "Tablets of Penicillin are packed in a suitable well-closed container which prevents the access of moisture and should be stored in a cool, dry place. They deteriorate on exposure to moist air." In addition, penicillin tablets are now required to lose not more than 1·0 per cent. of their weight when dried over P_2O_5 at a pressure not exceeding 5 mm. of mercury for twenty-four hours.

During the year under review 26 samples of penicillin preparations were examined by the micro-biological method of assay ; these consisted of 25 samples of tablets of penicillin B.P. (all submitted by County Sampling Officers) and one sample of lozenges of penicillin B.P. (submitted by Autonomous Food and Drugs Authority). Four of the samples of tablets of penicillin were reported upon adversely. The B.P. requires penicillin tablets to contain 200,000 Units of penicillin per tablet unless another quantity is specified and the actual number of units present, as determined by the micro-biological assay, is required to be not less than 90 per cent. of the prescribed or stated number. Informal samples Nos. N.3229 and N.3314 of Penicillin Tablets, both obtained from the same pharmacist's shop, were found upon examination to contain only 145,000 and 142,000 Units respectively instead of 200,000 Units. The

tablets in both samples showed slight brown discolouration and the vendor was communicated with and informed of their deterioration ; he confirmed that the remainder of the stock had been withdrawn from sale and destroyed and he also undertook to take steps to prevent any similar occurrence in future. Samples Nos. N.3134 and N.3230 were also both obtained from one pharmacist's shop. In this instance they were declared to contain 100,000 Units of penicillin but upon examination only 60,000 and 40,000 Units respectively were found to be present in the samples. These tablets also showed brown discolouration and the vendor agreed to withdraw the remainder of his stock from sale. Mention has already been made of the fact that penicillin preparations deteriorate unless protected from moisture and it is almost certain that the deficiences noted in the above instances were due to inefficient storage.

Ammoniated Tincture of Quinine.

This preparation of quinine sulphate, dilute solution of ammonia and 60 per cent. alcohol was deleted from the British Pharmacopoeia, 1948, but it is still, of course, included in the British Pharmaceutical Codex. The 1954 Codex prescribes the following standards for this commodity : quinine, 1·56 to 1·76 per cent. w/v calculated as anhydrous quinine ; ammonia, 0·85 to 1·05 per cent. w/v calculated as NH_3 ; alcohol, 52 to 54 per cent. v/v of ethyl alcohol. Official assays for both quinine and ammonia are also included in the formulary. It is also stated that it should be stored in well-closed containers and in a cool place. Careful storage is, of course, of paramount importance when one is dealing with preparations containing volatile constituents such as alcohol and particularly ammonia. Deficiency in ammonia is a common failure in samples of this preparation and this could be due to loss of ammonia during compounding but more probably to storage in containers which are not air-tight or which are frequently opened. The limits for the various constituents quoted above are the same as those given in the previous (1949) edition of the British Pharmaceutical Codex with the exception that the minimum limit for ammonia has been reduced from 0·90 per cent. w/v to 0·85 per cent. w/v.

During the year 1955 12 informal samples of Ammoniated Tincture of Quinine were submitted for examination, all by County Sampling Officers. Seven of the samples were reported upon adversely and details of these will be found in table 24. In each instance it will be noted that the sample was unsatisfactory in respect of its ammonia content only ; the deficiencies ranged from 0·08 per cent. to as much as 0·46 per cent. below the minimum limit for ammonia. The vendors of all the unsatisfactory samples were communicated with ; in three instances stocks were withdrawn from sale, in two instances no further stock existed and in

the remaining two instances the vendors were advised to prevent loss of ammonia by storing in well-stoppered bottles and by not dispensing retail sales from a continually used stock bottle.

Calomel and Grey Powder.

Both the above substances are preparations of Mercury. Calomel is Mercurous Chloride and Grey Powder is a mixture of Metallic Mercury and Chalk. Both were included in the British Pharmacopoeia, 1948, but Grey Powder has been omitted from the British Pharmacopoeia, 1953. Over the last three years or so there have been four inquests on infants at each of which it was recorded that death was due to Pink Disease caused by mercury ingested in the form of calomel teething powders or grey powder tablets. The 1954 edition of the British Pharmaceutical Codex states that there is some evidence that mercurial aperients play a part in the causation of acrodynia in infants and that they should not be given frequently. In view of the possible risk of mercurial poisoning one large firm manufacturing infant soothing or teething powders ceased to make powders containing calomel or any other form of mercury as long ago as December, 1953, and existing stocks made according to the old formula were recalled from sale. This would appear to be the action which has also been taken by other manufacturers but it is not always possible to trace old stocks. As will be seen from the information given below, in the few instances where samples of teething powders containing mercury have been found the manufacturers have readily agreed to withdraw the stocks from sale. Calomel and Grey Powder are the subjects of monographs in the British Pharmacopoeia and the British Pharmaceutical Codex respectively and they are both clearly of medicinal value; the danger arises, however, in giving preparations containing them to infants, particularly if this is done repeatedly or if a child should be particularly sensitive to mercury.

During the year under review 12 samples of teething powders were submitted for examination, eight by County Sampling Officers, and of these, three samples (two County) were found to contain calomel; the remaining nine samples were free from mercury. The amounts of calomel contained in the three samples reported upon adversely varied from 35 to 42 mgms. per powder; the dose of calomel according to the British Pharmacopoeia being 30 to 200 mgms. The two County samples which contained calomel had both been made by the same manufacturer; they proved to be old stock as the firm were no longer making this commodity and they agreed to withdrawn the remaining stocks from sale. The remaining sample containing calomel was submitted by an Autonomous Food and Drugs Authority; this was the product of another manufacturer, he was interviewed and agreed to stop distribution and to withdraw the remainder of any retail stocks from sale.

Glauber's Salt.

Sodium sulphate or Glauber's salt, is the subject of a monograph in the British Pharmacopoeia, 1953. It has the formula Na2SO4, 10 H2O and the whole of the ten molecules of water of crystallization may be lost by heating at 105°C. ; in fact, one of the tests for purity prescribed by the British Pharmacopoeia is that it shall lose not less than 51·5 per cent. and not more than 57·0 per cent. of its weight when dried at the above temperature. The official dose of this salt is 2 to 16 grammes.

In addition to the hydrated salt the British Pharmaceutical Codex, 1954, includes exsiccated Glauber's salt which simply consists of Glauber's salt that has been heated until all the water of crystallization is lost. The dose of this salt is only 1 to 8 grammes due to the fact that weight for weight it contains approximately twice as much actual sodium sulphate as the hydrated salt. The British Pharmaceutical Codex stipulates that exsiccated sodium sulphate shall lose not more than 5·0 per cent. of its weight when dried at 105°C.

Glauber's salt crystals possess the property of rapidly effloresc ing in dry air, that is, if stored in a dry place and not kept air-tight they fall to powder and at the same time progressively lose water of crystallization until they approximate in composition to the anhydrous salt. Glauber's salt is a common medicinal substance and is sometimes prepacked in cartons, etc., in readiness for retail sale ; the label on the carton usually includes a statement to the effect that the contents conform to the requirements of the British Pharmacopoeia although sometimes there is a further statement drawing attention to the loss of moisture which may occur on exposing the contents of the carton to dry air. The statement may also indicate that the quality of the commodity is thereby in no way impaired but, if it is found to be reduced to powder, the dose should be approximately halved.

During the year under review 11 informal samples of Glauber's salt were submitted for examination. Of these, 10 were submitted by County Sampling Officers and one by an Autonomous Food and Drugs Authority. Nine of the samples were found to be perfectly satisfactory but two of the County samples were reported upon adversely. Sample No. E.4560 upon examination was found to lose only 41·5 per cent. of its weight on drying at 105° C. as against the minimum loss specified in the B.P. of 51·5 per cent. The sample was partly in the form of crystals and partly as powder and it had clearly not been stored under air-tight conditions ; in view, however, of the fact that the carton bore a declaration drawing attention to the loss of moisture which might occur if the contents were exposed to the air no further action was considered necessary. The remaining unsatisfactory sample, No. E.4557, was purchased loose, it was entirely

in the form of fine powder and lost only 2·3 per cent. of its weight on drying at 105°C. It, therefore, conformed to the B.P.C. requirements for exsiccated Glauber's salt although it had been purchased simply as Glauber's salt ; it follows from this that a purchaser of this particular material might take double the intended dose. On enquiry it transpired that this sample was of very old stock and the vendor agreed to withdraw the remainder from sale.

Tincture of Iodine.

Weak solution of Iodine or, as it is usually called, tincture of Iodine is the preparation of Iodine commonly used as an emergency antiseptic for application to small wounds. The present limits for this preparation laid down in the British Pharmacopoeia, 1953, and those previously specified in the B.P. 1948 and in the B.P. 1932 are compared below :—

	B.P. 1948 and B.P. 1953.	B.P. 1932.
Iodine	2·45—2·55% w/v	2·45—2·55% w/v
Potassium Iodide ...	2·45—2·55% w/v	1·45—1·55% w/v.
Alcohol	85—88% v/v	85—88% v/v

In addition to the above preparation the British Pharmacopoeia, 1953, includes a strong solution of Iodine with 10 per cent. of Iodine and also an aqueous solution of Iodine containing five per cent. of Iodine. The 1955 Addendum to the British Pharmacopoeia has introduced no alterations to the above mentioned standards. Tincture of Iodine is made up with ethyl alcohol and distilled water but industrial methylated spirits (acetone free) can be used in the preparation of iodine paint intended for external use only subject to the observance of conditions laid down by the Board of Customs and Excise.

During the year under review 25 samples of tincture of iodine were examined in the County Laboratory. All the samples were submitted by County Sampling Officers. Of the total number examined six samples, all obtained from different vendors, were reported upon adversely and details of these will be found in table 24. Two of the samples showed only slight discrepancies from the B.P. limits and no action was advised. Informal sample No. E.4799, however, showed a deficiency of iodine of 0·27 per cent. and of potassium iodide of 0·55 per cent. below the minimum B.P. limits while sample No. E.5964 had an iodine content 0·15 per cent. above the maximum B.P. limit ; in both these instances the remainder of the stocks were withdrawn from sale. Informal sample No. N.3765

bore a label which stated " B.P. 1932 " yet the contents of the bottle conformed to the requirements of the 1953 B.P. On pointing out this discrepancy to the manufacturers they agreed to bring their labels up to date. The last unsatisfactory sample, No. N.4473, had an iodine content 0·32 per cent., and a potassium iodide content 0·43 per cent., above the maximum B.P. limit. This was a prepacked sample and there were indications that the bottle had not been securely stoppered and that some evaporation had occurred with the result that the remaining contents had become more concentrated. That this was the probable cause of the discrepancies was confirmed in that another sample taken from the same stock was found to be perfectly satisfactory.

Prosecutions.

When the adulteration of a sample is considered to be sufficiently serious, legal proceedings are instituted. Prosecution, however, is only one of the means of dealing with adulterated or otherwise unsatisfactory samples. A perusal of tables 11 and 24, which are concerned with the various types of milk adulteration and sophisticated samples other than milk, respectively, shows that many of the samples are only slightly adulterated. In the case of food and drug samples, other than milk, deterioration may be due to long storage or adulteration may be brought about by the action of some person other than the actual vendor. In these instances it is often considered appropriate to take less drastic action than legal proceedings. In the case of milk samples vendors are sometimes cautioned and subsequent samples then frequently prove to be genuine ; in other instances dairies are visited by the Sampling Officers in order to correct faulty dairy management which has given rise to unsatisfactory samples. In the case of other foods and drugs appropriate action may take the form of the surrender for destruction of the remainder of any unsatisfactory stocks, returning stocks to manufacturers or communicating with packers with regard to unsatisfactory labels, etc.

During the year a total of 413 County food and drugs samples were reported upon adversely and in respect of 28 of these prosecutions were instituted, 21 in respect of milk samples, one in respect of gin, one in respect of ice-cream, on in respect of Jersey Milk, one in respect of orange juice, two in respect of pork sausages and one in respect of whisky. In addition, there were 12 prosecutions under Section 19 of the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950 (10 in respect of raw undesignated milk, two in respect of milk stated to be pasteurised without use of a special designation and found to be raw milk) and two under Section 3, Food and Drugs Act, 1938, in respect of raw milk labelled as pasteurised milk, all sold in specified areas in the County.

There were 41 convictions or orders to pay costs and in the one remaining instance, the summons was dismissed although the analytical findings were not questioned. The total fines and costs during the year amounted to £261 7s. 6d. a figure which is the lowest since the year 1944. In table 26 will be found similar information to the above for the years 1912 to 1955 inclusive.

Table 26.

County Fines and Costs during the Years 1912–1955.

Year.	Number of Prosecutions.	Convicted or ordered to pay costs.	Dismissals, etc.	Fines and Costs. £ s. d.
1912–1935 ...	1504	1302	202	6,239 1 7
1936 ...	22	20	2	107 14 9
1937 ...	39	36	3	165 1 0
1938 ...	26	24	2	132 10 1
1939 ...	19	18	1	100 11 6
1940 ...	25	23	2	171 14 0
1941 ...	84	79	5	824 13 2
1942 ...	38	36	2	502 4 10
1943 ...	54	49	5	375 10 11
1944 ...	38	37	1	291 19 6
1945 ...	33	33	0	365 4 6
1946 ...	94	92	2	936 7 9
1947 ...	98	93	5	667 7 0
1948 ...	70	69	1	703 0 6
1949 ...	48	45	3	518 17 2
1950 ...	43	42	1	405 8 7
1951 ...	50	39	11	362 11 6
1952 ...	65	64	1	620 13 0
1953 ...	54	53	1	576 12 8
1954 ...	45	45	0	294 9 6
1955 ...	42	41	1	261 7 6
Total ...	2,491	2,240	251	14,623 1 0

Table 27.

Prosecutions arising out of Samples purchased during the year 1955.

District.	Number of Prose-cutions.	Convicted or ordered to pay costs.	Dismissals, etc.	Fines and Costs. £ s. d.
Blackburn R.D.C.	1	1	...	8 18 6
Chadderton U.D.C.	3	3	...	18 3 0
Chorley R.D.C.	2	2	...	47 7 0
Clitheroe R.D.C.	2	2	...	11 6 0
Crompton U.D.C.	2	2	...	11 5 0
Denton U.D.C.	1	1	...	11 1 0
Farnworth Borough	4	4	...	13 8 0
Grange U.D.C.	1	1	...	2 2 0
Heywood Borough	2	2	...	4 2 0
Hindley U.D.C.	1	1	...	9 4 0
Lancaster R.D.C.	1	1	...	14 4 0
Longridge U.D.C.	1	1	...	6 4 0
Prestwich Borough	3	3	...	13 7 0
Preston R.D.C.	2	2	...	14 10 0
Rawtenstall Borough ...	1	1	...	2 1 0
Tottington U.D.C.	1	1	...	9 6 0
Tyldesley U.D.C.	1	1	...	6 4 0
Ulverston R.D.C.	4	3	1	16 11 0
Urmston U.D.C.	3	3	...	11 12 0
Westhoughton U.D.C. ...	3	3	...	17 8 0
West Lancs. R.D.C.	3	3	...	13 4 0
County Districts	42	41	1	261 7 6
Autonomous Authorities ...	4	4	...	20 0 0
Total all sources	46	45	1	281 7 6

PART II.—THE MILK (SPECIAL DESIGNATION) (PASTEURISED AND STERILISED MILK) REGULATIONS, 1949 TO 1953.

Phosphatase Test, Half-hour Methylene Blue Test and Turbidity Test.

The above Regulations applying to heat-treated milk (as distinct from other Regulations relating to raw milk) were made jointly by the Minister of Health and the Minister of Food. The Regulations, besides relating to pasteurised milk, also provide for the special designation "sterilised milk."

The special designations for heat-treated milk are "Pasteurised" and "Sterilised" but in appropriate circumstances the designations "Tuberculin Tested Milk (Pasteurised)" and "Tuberculin Tested Milk (Sterilised)" may also be used.

Food and Drugs Authorities are responsible for the granting of pasteurising and sterilising licences but Local Authorities are responsible for all other licences required by the Regulations. The duties of Food and Drugs Authorities include the inspection of records, the inspection of the arrangements for processing milk and the taking of samples in respect of all plants for which licences have been granted.

An amendment to the Milk (Special Designation) (Pasteurised and Sterilised Milk) Regulations which came into operation on the 20th December, 1953, required the compulsory use of overlapping caps on all containers of pasteurised milk from the 1st October, 1954. It will be remembered that this same date was fixed in the principal Regulations for the operation of the requirement that pasteurised milk must be put into the containers in which it is to be delivered to customers on the premises at which it has been pasteurised. It follows from this that the bottling of pasteurised milk from churns by retailers and the sale of pasteurised milk by measure from a can are now both illegal. The amending Order also permits sterilised milk to be processed in cans and other containers of a capacity of not more than one gallon as well as in bottles.

Pasteurised milk must be treated by one or the other of the following processes :—

(*a*) Retained at a temperature of not less than 145°F. and not more than 150°F. for at least 30 minutes and be immediately cooled to a temperature of not more than 50°F. ; or

(*b*) Retained at a temperature of not less than 161°F. for at least 15 seconds and be immediately cooled to a temperature of not more than 50°F. ; or

(*c*) Retained at such temperature for such period as may be specified by the licensing authority with the approval of the Minister.

It will be noted that the temperature of 161°F given in (*b*) is 1°F lower than that originally specified ; the Minister of Food stated that this change would improve the " cream line " of the milk without, on present evidence, causing any risk to health.

Sterilised milk must be filtered or clarified, homogenised and heated to and maintained at such a temperature, not less than 212°F., for such a period as to ensure that it will comply with the turbidity test prescribed.

The Regulations state that samples may be taken at any time while the milk is in the possession of the processor or of the licensed dealer. Unopened bottles should be taken as samples where possible but where the milk is in bulk (exceeding 1 quart) it may be sampled into sterile bottles. All samples must be carried in insulated containers (not artificially cooled) and they must arrive at the laboratory on the day of sampling.

Three tests are prescribed, a phosphatase test and half-hour methylene blue test for pasteurised milk and turbidity test for sterilised milk. Samples intended for examination by the phosphatase test must be stored in the laboratory at a temperature of between 32°F and 40°F while samples intended for the methylene blue test must be stored at the laboratory at an atmospheric shade temperature not exceeding 65°F. No storage temperature is prescribed for samples of sterilised milk.

The phosphatase test depends on the liberation of free phenol from the salt disodium phenyl phosphate by the enzyme phosphatase. This enzyme is always present in raw milk but is almost entirely destroyed by the amount of heat-treatment necessary for efficient pasteurisation, *i.e.*, necessary for the destruction of m-Tuberculosis and other pathogenic micro-organisms. The amount of phenol liberated in the test is an approximate but not directly proportionate measure of the phosphatase remaining in the milk ; a high result indicating insufficient heat-treatment or the presence of raw milk. The test is extremely delicate and it is essential that great care be exercised in collecting the samples for submission to the test, in testing the purity of the reagents used and in the actual carrying out of the test.

The methylene blue test depends on the decolorisation of methylene blue by bacteria and reducing substances present in milk. If under the conditions of the test, decolorisation occurs in less than 30 minutes it is

deemed that there has been such a development of bacteria and reducing substances in the milk as to render its keeping quality unsatisfactory. The test is designed to ensure that milk will keep fresh, if kept reasonably cool, until the next day's supply is received by the consumer and with that end in view samples, before examination in the laboratory, are not kept in a refrigerator but are merely kept at atmospheric shade temperature not exceeding 65°F. It should be noted that the half-hour methylene blue test prescribed by these Regulations is quite different from the methylene blue test prescribed in the Milk (Special Designation) (Raw Milk) Regulations, 1949, in relation to raw designated milks.

The turbidity test for sterilised milk is based upon the fact that heating to not less than 212°F for a period sufficient for effective sterilisation will also completely denature all the soluble protein of the milk. Samples which show the presence of soluble protein under the conditions of the test are insufficiently heated or contain raw milk.

The Milk (Special Designations) (Specified Areas) Orders 1952 to 1955.

It will be recalled that following the publication of a government memorandum on Measures to Improve the Quality of the Nations Milk Supply the Minister of Food was given power under Regulation 55 G of the Defence (General) Regulations, dated 20th January, 1944, to restrict the sale of raw milk within any area which had been specified for that purpose in an Order made by the Minister. Before an area could be made a specified area it was, of course, necessary for the Minister to satisfy himself that adequate plant was available for heat-treating the whole of the milk sold within the area, with the exception of Tuberculin Tested Milk and certain Accredited Milk. Similar provisions to the above were included in the Milk (Special Designations) Act, 1949, and Regulation 55 G was then revoked. This Act was, in turn, repealed and replaced by the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950, which came into operation on the 1st January, 1951, and which also consolidated certain other enactments. Section 19 of this Act made it compulsory to use a special designation in respect of all sales of milk by retail for human consumption in an area which has been designated by Order as a Specified Area. The only exceptions refer to catering sales and to the sale of milk by a producer to his employees, if, in the latter instance, he does not engage in any other selling of milk by retail. Section 23 of the same Act empowered the Minister of Food to bring into operation by Order the provisions of Section 19 in any area. The special designations which may be used in relation to heat-treated milk in a Specified Area are " Pasteurised," " Sterilised," " Tuberculin Tested Milk (Pasteurised) " and " Tuberculin Tested Milk (Sterilised)." In relation to raw milk the special designation now permitted is " Tuberculin Tested." The use of

the special designation "Accredited" was prohibited in specified areas on and after the 1st October, 1954, by Section 22 of the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950.

The preceding paragraph describes the position as regards the making of Specified Areas up to and including the early months of the year 1955 but, due to the making of the two Transfer of Functions Orders and the passing of the Food and Drugs Act, 1955, referred to at the beginning of this report, certain alterations in the law, particularly as to procedure, have since been made. When the Ministry of Food was dissolved on the 7th April, 1955, the function of the Minister of Food to make Milk (Special Designations) (Specified Areas) Orders was transferred to the Minister of Agriculture, Fisheries and Food and this function was again transferred on the 6th July, 1955, to the Minister of Agriculture, Fisheries and Food and the Minister of Health acting jointly following the making of the Transfer of Functions (Food and Drugs) Order, 1955. Due to the coming into operation of the Food and Drugs Act, 1955, on the 1st January, 1956, Sections 19, 22 and 23 of the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950 (which relate to the compulsory use of special designations in Specified Areas, the abolition of the special designation "Accredited" and the function of the Ministers to make Milk (Special Designations) (Specified Areas) Orders) have now been replaced by Sections 37, 40 and 41 respectively of the 1955 Act.

The first Milk (Special Designations) (Specified Areas) Order which affected part of the area of the County Food and Drugs Authority came into operation on the 1st November, 1952. Three other similar Orders came into operation on the 1st January, 1954, the 1st October, 1954, and the 6th December, 1955, respectively. By the end of the year 1955 a total of 42 of the 92 County districts in the County Food and Drugs area had become specified areas. In view of the fact that it is the duty of the Food and Drugs Authority to enforce the provisions of Section 37 of the Food and Drugs Act, 1955, it follows from the above that an increasing number of samples of special designation heat-treated milks are being taken by County Sampling Officers in the County districts concerned for submission to the County Laboratory for examination by the usual statutory Phosphatase, Half-hour Methylene Blue or Turbidity tests. In this connection it is interesting to note that 14 successful prosecutions were instituted during the year under review: 12 under Section 19 of of the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950, (10 in respect of raw undesignated milk, two in respect of milk stated to be pasteurised milk without use of a special designation and found to be raw milk) and two under Section 3, Food and Drugs Act, 1938, in respect of raw milk labelled as pasteurised milk, all sold in specified areas in the County.

During the year, 1,298 samples of milk were submitted for examination by the Phosphatase test and the Half-hour Methylene Blue test or by the Turbidity test. The samples were marked either Pasteurised, Tuberculin Tested (Pasteurised) or Sterilised and tables 28, 29 and 30 give particulars of the results obtained. In addition 10 samples of raw milk were submitted for examination by the Phosphatase test and the Half-hour Methylene test and, as was to be expected, they failed to pass the Phosphatase test. As already mentioned these samples were the subject of successful prosecutions. It should also be mentioned that one of the County samples submitted to the Phosphatase test clotted on boiling and no report was issued ; the Regulations state that any samples which show a taint or clot on boiling must not be tested.

With regard to the methylene blue test the Regulations prescribe that it shall be commenced between 9 a.m. and 10 a.m. on the day after the sample was taken and that in the meantime, as already indicated, it shall be kept at the laboratory at atmospheric shade temperature not exceeding 65°F (the sample must not be kept in a refrigerator). During periods of exceptionally warm weather the shade temperature often exceeds the limit specified. Of the numbers reported as unsatisfactory in table 29, 56 samples, submitted by County Sampling Officers, and the two submitted by an Autonomous Authority were kept at shade temperatures exceeding 65°F. and these, therefore, should be deducted from the total number of unsatisfactory samples to arrive at the number failing to pass the statutory test. It should be mentioned, however, that even when the shade temperature exceeds 65°F. a considerable number of samples will still pass the test ; in view of the fact that keeping quality is particularly desirable in warm weather it is unfortunate that the statutory test cannot then be applied. With regard to the turbidity test it will be observed from table 30 that all samples of sterilised milk satisfactorily passed the test.

Table 28.

Phosphatase Tests, 1955.

Type of Milk.	Number Submitted.		Number Unsatisfactory.					
			County.			Borough.		
	County.	Borough.	Group II.	Group III.	Total	Group II.	Group III.	Total.
Pasteurised ..	675	70	2	6	8	0	1	1
T.T. (Pasteurised)	333	69	1	1	2	1	1	2
Raw Milk ..	10	0	0	0	0	0	0	0
Totals	1,018	139	3	7	10	1	2	3

Table 29.

Half-hour Methylene Blue Tests, 1955.

Type of Milk.	Number Submitted.		Number Unsatisfactory.	
	County.	Borough.	County.	Borough.
Pasteurised	674	69	40	0
T.T. (Pasteurised) ..	333	69	19	2
Raw Milk	10	0	0	0
Totals	1,017	138	59	2

Table 30.

Turbidity Tests, 1955.

Type of Milk.	Number Submitted.		Number Unsatisfactory.	
	County.	Borough.	County.	Borough.
Sterilised	140	11	0	0
T.T. (Sterilised) ..	0	0	0	0
Totals	140	11	0	0

PART III.—THE FERTILISERS AND FEEDING STUFFS ACT, 1926.

The Fertilisers and Feeding Stuffs Act, 1926, came into force on July 1st, 1928. It is intended to safeguard the purchasers of substances used for the fertilisation of the soil and for the feeding of cattle and poultry.

The general purpose of the Act, like that of the Act of 1906, which it repealed, is to provide civil remedies for the misdescription of, and to prevent fraud in, fertilisers and feeding stuffs. Its scope is defined by Regulations made by the Minister of Agriculture, Fisheries and Food.

In addition, during and since the war, a number of Regulations governing the control and composition of fertilisers and feeding stuffs were made by appropriate Government Departments. In this connection, however, the Minister of Food made, in the year 1953 the Feeding Stuffs (Revocation) Order which came into operation on the 1st August, 1953. The effect of this Order was to revoke all Orders made under the Defence (General) Regulations, 1939, which were concerned with the control of

the manufacture, licensing, rationing and prices of Feeding Stuffs. The only statutory control of the composition of Feeding Stuffs now in operation is, therefore, that exercised under the Fertilisers and Feeding Stuffs Act, 1926.

It should, however, be noted here that during the years 1953 and 1954, in exercise of powers under Section 2 of the Therapeutic Substances (Prevention of Misuse) Act, 1953, Regulations were made by the Minister of Health which permit the use of certain antibiotics, *viz.*, penicillin, aureomycin and oxytetracycline, in pig foods and poultry foods. These Regulations prescribe conditions with regard to labelling and also specify maximum limits for the amounts of the prescribed antibiotics which may be present.

It has already been mentioned that the scope of the Fertilisers and Feeding Stuffs Act is defined by Regulations. The Regulations operative during the year 1955 were the Fertilisers and Feeding Stuffs Regulations, 1932, to which minor amendments had been made in the years 1942 and 1951. In November, 1955, however, the Minister of Agriculture, Fisheries and Food made the Fertilisers and Feeding Stuffs Regulations, 1955, which came into operation on the 1st January, 1956. While the new Regulations follow, in general, the form of the 1932 Regulations they have, however, been completely redrafted and include amendments recommended by the Standing Advisory Committee. Although certain amendments have been made to the methods of analysis the Standing Advisory Committee is engaged in carrying out a general review of the prescribed methods and it is expected that when this is completed amending Regulations will be made which will include the Committee's recommendations.

The main additions which have been made to the methods of analysis are : methods for the determination of the neutralising value and magnesium content of liming materials and a method for the determination of nitrogen when both nitrates and chlorides are present. The amendments include : alterations in the procedure given for the determination of potash in guanos and mixed fertilisers by the perchlorate method ; a prescribed test has been included for establishing the absence of nitrates in fertilisers ; in the method for the determination of sugar in feeding stuffs the clearing agent prescribed is now zinc ferro-cyanide and the instructions for inverting the sugar have been altered ; finally, the method for the determination of salt in feeding stuffs now requires the sample to be ashed in the presence of sodium carbonate instead of in the presence of lime.

In regard to sampling there is no change in the number of packages or portions to be taken in relation to the quantity of fertiliser or feeding stuff sampled but amendments have been made to the actual sampling procedure in the light of experience. For example, a shovel is now

prescribed as a more satisfactory sampling tool than a spade ; the initial mixture from which the sample is finally to be drawn has now to be coned and quartered until reduced to the required quantity, a mechanical quartering device or riffle may be used for this purpose ; when a sampling spear is used this must now be a closed one but objection may be taken to its use if the material to be sampled is unsuitable ; the size of the final sample is now only required to be approximately of the weight specified whereas formerly the size of the sample had to conform precisely to certain limits.

The limits of variation permitted in respect of ingredients have been amended for certain commodities where changes were considered advisable. For example : the limits of variation for compound fertilisers and mixed fertilisers have been simplified and provision has now been made to couple the limits for the more concentrated fertilisers with the quantity of the material samples. The sliding scales which previously interrelated the nitrogen and phosphoric acid contents of bone meal, fish residues and meat and bone residues have either been abolished or simplified. Limits for fibre content in compound feeding stuffs and millers offals previously applied equally whether there was an excess or a deficiency in fibre, although it was generally agreed that the purpose of the limit was to prevent an excessive fibre content being present in the feeding stuff. The limit for fibre in these commodities has now been relaxed to a 50 per cent. variation where the amount found is less than the amount declared. The limits for oil content were previously very stringent particularly for those feeding stuffs which only contain a small total percentage of oil, *i.e.*, a compound feeding stuff declared to contain 3·0 per cent. of oil was only permitted 0·3 per cent. variation. The minimum variation permitted for the oil content of all feeding stuffs is now 0·75 per cent.

The opportunity has also been taken in making the new Regulations to redraft the Schedules to the Fertilisers and Feeding Stuffs Act. The First and Second Schedules, which state the particulars which must be given in Statutory Statements, now include a number of new commodities which have come into general use since the 1932 Regulations were made, *i.e.*, triple superphosphate, dicalcium phosphate, oatmeal by-products, screened chalk, etc. Other amendments here include the declaration of the amount of phosphoric acid soluble in citric acid for dicalcium bone phosphate and for basic slag ; it is no longer necessary to declare the acidity of sulphate of ammonia if the actual amount is no more than 0·025 per cent. and it is no longer necessary to couple the word " albuminoids " with the word " protein " when declaring the amount of the latter ingredient ; the neutralising value of all forms of liming materials is now required to be expressed in terms of the equivalent of quick lime (CaO).

The Third and Fifth Schedules are unaltered but the Fourth Schedule (which relates to implied definitions of fertilisers and feeding stuffs) has been amended to provide definitions for the new commodities included in the First and Second Schedules. A definition of bone meal grade II has also been included and substances sold under the name compound fertiliser or fertiliser mixture must now contain at least two of the fertilising elements.

From the above brief description of the new Regulations it will be seen that they follow very closely the pattern set by previous Regulations, the greatest difference probably being the altered particulars and definitions now relating to liming materials. The Regulations make no direct reference to trace elements in fertilisers or to vitamins or antibiotics in animal feeding stuffs.

Fifty-two samples have been examined for the County during the year under review. The number of County samples, therefore, has been maintained at the level reached over the previous six years. Of these, 21 were fertilisers and 31 consisted of feeding stuffs. The fertilisers comprised 19 formal samples and two informal samples. The feeding stuffs consisted of 27 formal and four informal samples.

In addition 24 informal samples (19 fertilisers and five feeding stuffs) were examined for Autonomous Authorities.

Of the 21 samples of fertilisers examined for the County 13 were found upon analysis to be correct within the limits of variation permitted by Regulations made under the Act and six showed minor deviations outside the permitted limits of variation. Formal sample No. 13/11/A, Hoof and Horn, showed a deficiency in its nitrogen content, after allowing for the limits of variation, of 1·0 per cent. This deficiency, in the opinion of your Analyst, might be to the prejudice of the purchaser. The manufacturers were communicated with and expressed regret at the nitrogen deficiency in this product and undertook to give the matter their particular attention in future. The remaining sample, No. 9/4/A, Sulphate of Ammonia, which was also taken formally, was found to have an excess free acid content, after allowing for the limits of variation, of 0·08 per cent. The excess of free acid found might be to the prejudice of the purchaser but a further formal sample, taken subsequently from the same manufacturers, was found, within the limits of variation, to be correct in its free acid content.

With regard to the 31 samples of feeding stuffs examined for the County, 20 were found to be correct within the permitted limits of variation. With regard to the remaining 11 samples minor deviations only from the guaranteed figures were found.

In tables 31 and 32 will be found particulars of all the samples of fertilisers and feeding stuffs examined for the County. The tables include the results obtained on analysis and, for comparison, the figures guaranteed in Statutory Statements, etc.

Table 31.

Composition of Fertilisers, 1955.

Sample Number, District and Description.	Formal or informal.	Per cent. Nitrogen.		Per cent. Phosphoric Acid (P_2O_5).						Per cent. Potash. K_2O.		Other Figs. per cent.
				Soluble.		Insoluble.		Total.				
		G.	F.	G.	F.	G.	F.	G.	F.	G.	F.	
3/11/B Widnes—Steamed Bone Meal	I	0·82	1·06					27·5	31·5			
7/4/A Lower Blackburn—Hoof Meal ..	F	14·0	14·7									
8/4/A Lower Blackburn—Bone Meal ..	F	3·7	4·0					20·6	22·6			
12/11/A Widnes—"—" Tomorite	F	4·5	4·5	5·0	5·37	1·25	1·38		6·75	8·0	7·5	
13/11/A Widnes—Hoof and Horn	F	14·0	12·5									A
11/10/A Seaforth—"—" A.S. Base 240. 5501 ..	F	3·13	3·0	4·05	4·4	1·95	2·3		6·7	12·0	11·4	
12/10/A Seaforth—D General Manure 5. 5518	F	8·2	8·45	1·4	1·75	2·58	2·10		3·85	5·25	5·10	
14/11/A Widnes—Nitrate of Soda	F	15·5	15·8									
15/11/A Widnes—Sulphate of Ammonia ..	F	20·6	20·9									B
16/11/A Widnes—Superphosphate	F			18·0	18·7	1·0	1·2	19·0	19·9			
3/4/B Lower Blackburn—Sulphate of Potash.. ..	I									48·0	49·1	
9/4/A Lower Blackburn—Sulphate of Ammonia ..	F	20·60	20·8									C

Table 31—continued.

Sample Number, District and Description.	Formal or informal.	Per cent. Nitrogen.		Per cent. Phosphoric Acid (P_2O_5).						Per cent. Potash. K_2O.		Other Figs. per cent.
				Soluble.		Insoluble.		Total.				
		G.	F.	G.	F.	G.	F.	G.	F.	G.	F.	
4/9/A Manchester—Dried Blood ..	F	12·0	11·9									
5/9/A Manchester—Blood and Bone Compound ..	F	5·0	6·3					8·0	12·0			
10/4/A Lower Blackburn—Sulphate of Ammonia ..	F	20·60	21·0									D
13/10/A Seaforth—"High Grade" for Potatoes ..	F	7·38	7·0	9·8	9·34	0·56	0·70		10·04	12·00	11·8	
13/2/A Lonsdale—Special Grass Fertiliser ..	F	6·0	6·3	9·0	9·3	1·5	1·7	10·5	11·0	5·0	4·5	
14/2/A Lonsdale—Special Potato Fertiliser ..	F	7·0	7·4	6·5	6·3	0·5	0·7..	7·0	7·0	10·5	11·2	
17/11/A Widnes—"—" Chrysanthite	F	6·5 (Organic 3·0)	6·5 (Organic 3·1)	5·0	4·5	4·0	4·3		8·8	5·0	5·8	
18/11/A Widnes—"—" 513 D.S. Fertiliser ..	F	5·0	4·8	11·5	11·15	1·0	1·25		12·40	12·5	12·7	
7/9/A Manchester—Sulphate of Ammonia ..	F	20·6	20·9									E

G.—Guaranteed.

F.—Found.

A.—Found, Ash 10·2, Sand and Other Siliceous Matter 4·2, Moisture Before Grinding 13·9, Moisture After Grinding 13·2.

B.—Guaranteed Free Acid (H_2SO_4) Does not exceed 0·025; Found, Free Acid (H_2SO_4) 0·025.

C.—Guaranteed, Free Acid (H_2SO_4) 0·025; Found, Free Acid (H_2SO_4) 0·11.

D.—Guaranteed, Free Acid (H_2SO_4) 0·025; Found, Free Acid (H_2SO_4) 0·029.

E.—Guaranteed, Free Acid (H_2SO_4) 0·025; Found, Free Acid (H_2SO_4) 0·025.

Table 32.

Composition of Feeding Stuffs, 1955.

Sample Number, District and Description.	Formal or Informal.	Per cent. Oil.		Per cent. Albuminoids (Protein).		Per cent. Fibre.		Other Figures. per cent.
		G.	F.	G.	F.	G.	F.	
7/3/A Kirkham— Poultry Food 2A, Growers Mash ...	F	4·5	4·4	16·0	15·1	6·5	4·3	...
8/3/A Kirkham— Calf Starter Meal No. 1	F	4·5	4·1	22·5	23·5	5·5	5·2	...
9/2/A Lonsdale— Palm Kernel Meal ...	F	5·5	6·0	17·0	15·4			...
10/2/A Lonsdale— Linseed Meal (Cake) ...	F	7·93	7·6	34·12	33·5			...
5/5/A Higher Blackburn— Layers Mash	F	3·5	3·7	16·75	16·5	5·5	5·4	...
6/5/A Higher Blackburn— National Pig Food No. 2	F	3·0	2·9	14·0	13·8	5·5	5·1	...
9/6/A Leyland— Barley Meal	F						5·6	A
10/6/A Leyland— Sussex Ground Oats	F		4·1		9·3		10·2	B
9/7/A Bury— Barley Meal Grade 2 ...	F						4·1	C
10/7/A Bury— Pea Meal...	F						6·5	D
2/9/A Manchester— Barley Meal Grade 2 ...	F						5·0	E
3/9/A Manchester— Millers Offal (Fine) ...	F					9·5	7·4	H
9/3/A Kirkham— Indian Meal	F						2·1	I
10/3/A Kirkham— Barley Meal	F						4·6	J
11/2/A Lonsdale— Pig Rearing Meal ...	F	3·0	2·8	14·0	14·4	7·0	4·1	...
12/2/A Lonsdale— Pig Fattening Meal ...	I	3·0	2·9	13·0	13·0	7·0	3·4	...
11/6/A Leyland— Fine Wheatfeed ...	F					9·0	8·0	K
12/6/A Leyland— Bran	F					11·0	10·5	L

Table 32—continued.

Sample Number, District and Description.	Formal or Informal	Per cent. Oil.		Per cent. Albuminoids (Protein).		Per cent. Fibre.		Other Figures. per cent.
		G.	F.	G.	F.	G.	F.	
4/4/B Lower Blackburn—Pig Fattening Meal ...	I	3·0	2·8	14·0	13·5	6·0	5·1	...
11/4/A Lower Blackburn—Layers Mash	F	3·0	2·8	17·5	16·6	5·0	3·6	...
11/7/A Bury—No. 1 Dairy Nuts ...	F	4·5	3·4	18·5	17·5	9·0	8·1	...
12/7/A Bury—Pig Fattening Meal ...	F	4·0	2·8	13·0	12·1	7·0	3·4	...
7/5/A Higher Blackburn—National Pig Food No. 2	F	3·0	2·9	14·25	14·3	4·7	4·9	...
8/5/A Higher Blackburn—Layers Mash	F	3·3	3·4	16·3	16·8	5·25	5·6	...
5/8/A Rochdale—Layers Mash	F	3·5	3·6	16·5	15·6	6·0	5·9	...
6/8/A Rochdale—Sow and Weaner Meal with C.L.O.	F	4·0	4·0	17·0	15·7	6·0	5·9	...
1/7/B Bury—Winter Layers Meal ...	I	4·0	3·7	17·0	14·8	4·75	3·6	...
2/7/B Bury—Layers Mash, Vitamins A and D added ...	I	3·5	2·8	17·5	16·1	5·0	4·4	...
6/9/A Manchester—"——" Pig and Poultry Yeast	F		1·24	40·0	43·35			M
13/7/A Bury—Winter Layers Meal ...	F	4·0	3·7	17·0	15·8	4·75	3·7	...
15/7/A Bury—Layers Mash, Vitamins A and D added ...	F	3·5	3·5	17·5	16·4	5·0	4·7	...

A.—Found, Sand and Other Siliceous Matter 0·7 and Ash 2·4.
B.—Found, Sand and Other Siliceous Matter 0·9 and Ash 2·5.
C.—Found, Sand and Other Siliceous Matter 0·6 and Ash 2·3.
D.—Found, Sand and Other Siliceous Matter 0·3 and Ash 3·2.
E.—Found, Sand and Other Siliceous Matter 0·7 and Ash 2·8.
H.—Found, Sand and Other Siliceous Matter 0·2 and Ash 4·3.
I.—Found, Sand and Other Siliceous Matter 0·14 and Ash 1·66.
J.—Found, Sand and Other Siliceous Matter 0·6 and Ash 2·3.
K.—Found, Sand and Other Siliceous Matter 0·2 and Ash 4·9.
L.—Found, Sand and Other Siliceous Matter 0·1 and Ash 5·8.
M.—Found, Sand and Other Siliceous Matter 0·20 and Ash 7·94.

PART IV.—WATERS, EFFLUENTS, ETC.

Potable Waters.

Seventy samples of water have been examined during the year 1955 for suitability for drinking or domestic use. Of these 26 came from dairies. Ten of the samples were examined for metallic contamination only and the remaining 60 which were submitted for full sanitary analysis are classified in the following table according to their source and quality.

Table 33.

Waters, 1955.

Source.	Fit.	Doubtful.	Unfit.	Total.
Deep Well	9	0	0	9
Shadow Well	0	3	2	5
Upland Surface	31	1	0	32
Spring	5	0	1	6
Miscellaneous	7	0	1	8
Total	52	4	4	60

Forty of the samples in the above table were from public supplies (32 upland surface waters and eight from deep wells). Seven of these contained traces of nitrite. As this can result from chemical treatment of water or from the reduction of nitrates as well as from pollution, special consideration of the bacteriological findings was advised. All the other samples were of good quality. The one upland surface water classified as of doubtful quality in table 33 had a slight phenolic odour (phenol content 0·08 part per million) ; this was almost certainly due to the water having passed through new mains.

Twenty-seven of the 70 samples were submitted by the County Medical Officer of Health, the others being received from the following local authorities : City of Lancaster, 10 ; County Boroughs of—Preston, 4 ; Southport, 4 ; Boroughs of : Chorley, 5 ; Darwen, 4 ; Leigh, 2 ; Morecambe and Heysham, 1 ; Urban Districts of : Leyland, 1 ; Urmston, 1 ; Walton-le-Dale, 1 ; Rural Districts of : Fylde, 1 ; Garstang, 5 ; Preston, 1 ; Wigan, 3.

Toxic Metals in Water.

Samples which had been in contact with lead, copper or zinc, either in service pipes or during subsequent storage, were examined for the presence of these metals.

Twenty-seven samples were examined for lead and the results are summarised in table 34. All contained less than 0·1 part per million, the usually accepted safe upper limit being 0·3 part per million.

Table 34.

Lead parts per million.	None Detected.	Less than 0·1.	0·1 to 0·3.	0·5.	0·9.
Number of Samples ...	23	4	—	—	—

Of the 15 samples examined for copper only one contained a significant quantity of this metal and in that instance only 0·26 part per million was found.

Zinc was absent in the nine samples examined for this metal.

Iron was found in 12 of the 22 samples tested for it and six of these contained quantities in excess of the 0·4 part per million which is usually regarded as the upper limit above which complaints due to turbidity or staining may arise. The quantities found in these cases were 0·9, 2·7, 3·4, 4·2, 4·9 and 95·0 parts per million, all of which rendered the untreated waters quite unfit for domestic use.

In addition 10 samples of water from the City of Lancaster were examined for their action on new lead, tin-washed lead, galvanised iron and iron pipes. Results of the following order were obtained for contact periods of from 30 to 40 hours. Tin-washed lead pipe and unlined lead pipe ; lead 1·2, 0·4, 0·4 and 0·1 parts per million. Galvanised iron pipe and galvanised steel tank : zinc 22·8, 3·7, 2·2 and 7·0 parts per million. Unlined wrought iron pipe : iron 20·0 and 25·0 parts per million. No detectable amount of iron was yielded from the galvanised iron pipe or from the galvanised steel tank in this series of tests.

Other Waters, Effluents, etc.

Forty-eight samples were examined under this heading.

Four effluents were examined ; one trade effluent for purposes of assessment under the Public Health (Drainage of Trade Premises) Act, 1937, two sewage effluents for compliance with the recommended standards of purity made by the Royal Commission on Sewage Disposal (both sewage effluents were found to be unsatisfactory), while the fourth sample, taken from a sewage plant, was found to be contaminated with 15 per cent. of tarry matter from a local gas works.

Twenty-nine samples of swimming bath water were examined for compliance with the Ministry of Health Recommendations (pH. should exceed 7·0 but should not exceed 8·0 and free chlorine should not be less than 0·2 part per million or much greater than 0·5 part per million). Five samples conformed in all respects, 11 were slightly outside these limits and 13 did not comply. The majority of these samples were taken during the summer of 1955 when phenomenally hot weather was experienced and the bathing load was exceptionally high.

Three samples of river water were examined in order to assess their possible action on concrete. All were shown unlikely to be corrosive.

Three samples of water found seeping into cellars were analysed to ascertain their probable sources. One was mains water, one contained sewage and one appeared to originate from an industrial washing plant.

Four samples of pond water were examined, one in connection with seepage and three to ascertain if there would be any danger to health if they were used for paddling and bathing.

The remaining five samples consisted of effluents and sludges submitted in order to determine the preponderating reason for the silting-up of a tidal creek.

PART V.—MISCELLANEOUS SAMPLES.

This section of the report includes those samples which because of their nature or because of the circumstances under which they were obtained, could not be included in previous sections of the report. Two hundred and eighty-eight samples were examined under this heading and they were submitted as follows : County Medical Officer of Health, 30 ; County Education Officer, 2 ; Chief Officer, County Fire Brigade, 3 ; County Police (Weight and Measures Dept.), 3 ; City of Lancaster, 71 ; County Borough of Preston, 75 ; County Borough of Southport, 8 ; Borough of Leigh, 71 ; Borough of Morecambe and Heysham, 1 ; Urban District of Leyland, 3 ; Urban District of Poulton-le-Fylde, 1 ; Urban District of Urmston, 2 ; Urban District of Whitefield, 1 ; Urban District of Worsley, 6 ; 11 samples were also examined for the information of the laboratory. The work carried out on some of the more interesting of these samples is discussed briefly in the following paragraphs.

Atmospheric Pollution.

During the year 1955, work was continued on the measurement of atmospheric contamination for the Borough of Leigh, the County Borough of Preston and the City of Lancaster. Commencing in April analytical

work was also undertaken in connection with a soot deposit gauge in the County Borough of Southport. During the year under review 113 deposits from soot gauges and 108 lead peroxide candles were analysed from the 10 sites operated by the four Authorities.

The results from these observations as well as being of local interest are also used as part of a nation-wide investigation by the Department of Scientific and Industrial Research to study any long term changes in atmospheric pollution and their possible effects on Public Health problems.

The standard soot deposit gauge consists of a large glass funnel of known area leading into a bottle large enough to hold a month's rainwater. The soot and water collected are brought into the laboratory at the end of each month for analysis, the determinations carried out being those listed in table 35. The sulphur candles are porcelain cylinders of known area which are covered with a layer of lead peroxide prepared under standard conditions. This surface, on exposure at the site, reacts chemically with sulphur gases present in the surrounding atmosphere and when it is examined at the end of the month its sulphate content is proportional to the average concentration of corrosive sulphur gases in the air at that point for the whole of the month. This information is important as it is an indication of the effect of the polluted atmosphere on paintwork, metals, curtains, etc. It should be noted that, even if visible smoke and grit emission from chimneys are prohibited and smokeless zones become more common, sulphur gases will still be released into the atmosphere whenever coal or smokeless solid fuel is burned and it is these invisible gases which cause such damage to man, property and vegetation.

The seasonal variation for insoluble solids (soot) and active sulphur for the three sites in the Borough of Leigh are shown graphically in figures I and II. It will be seen that the amount of atmospheric contamination, as measured by gauge or candle, varies quite a lot from month to month being affected by such factors as direction and strength of the wind, temperature, season, rainfall, etc. The results from five or more years observations have to be patiently gathered together, therefore, before these seasonal variations can be allowed for and conclusions reached regarding the significance of any increase or decrease in pollution.

Since the prevailing wind is from the West, most information is obtained in atmospheric pollution investigations by selecting the measuring sites so that one is on the outskirts to the West, one in the centre and the third on the East side of the area under investigation. For example, in the Borough of Leigh the sites chosen with this in view are, going from West to East, the Firs Maternity Home, the Town Hall

BOROUGH OF LEIGH, 1955

FIG. I.

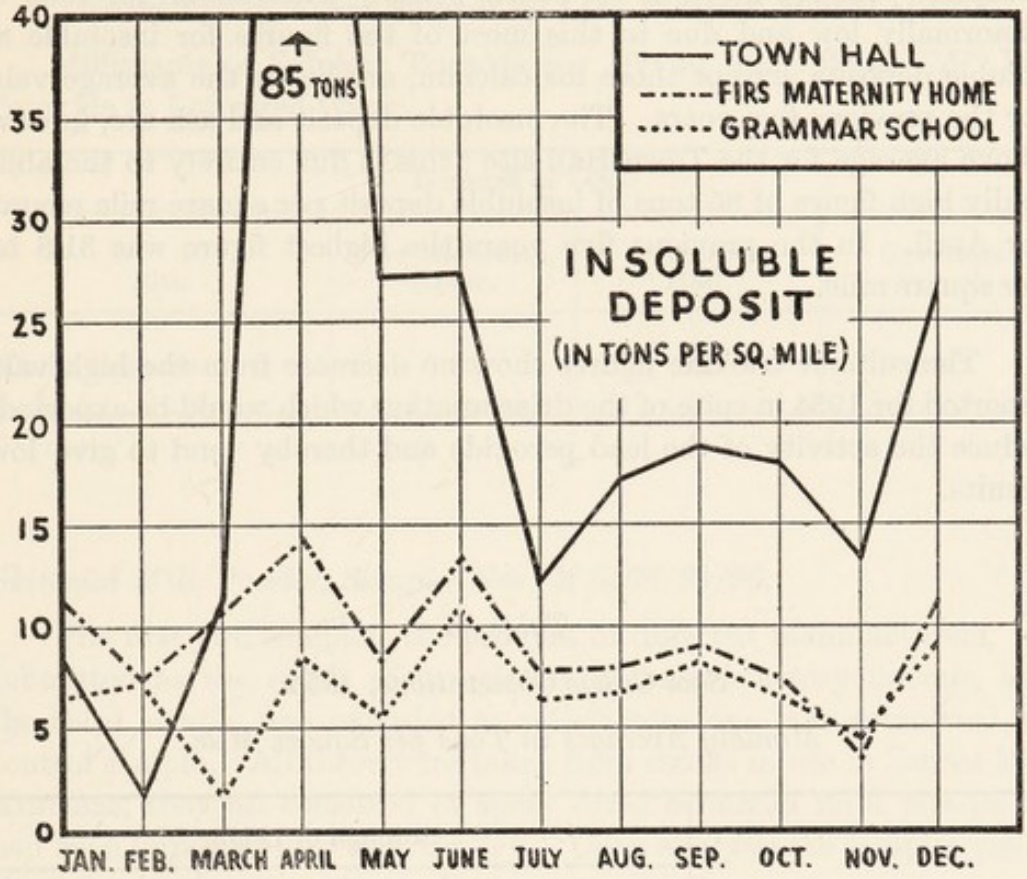
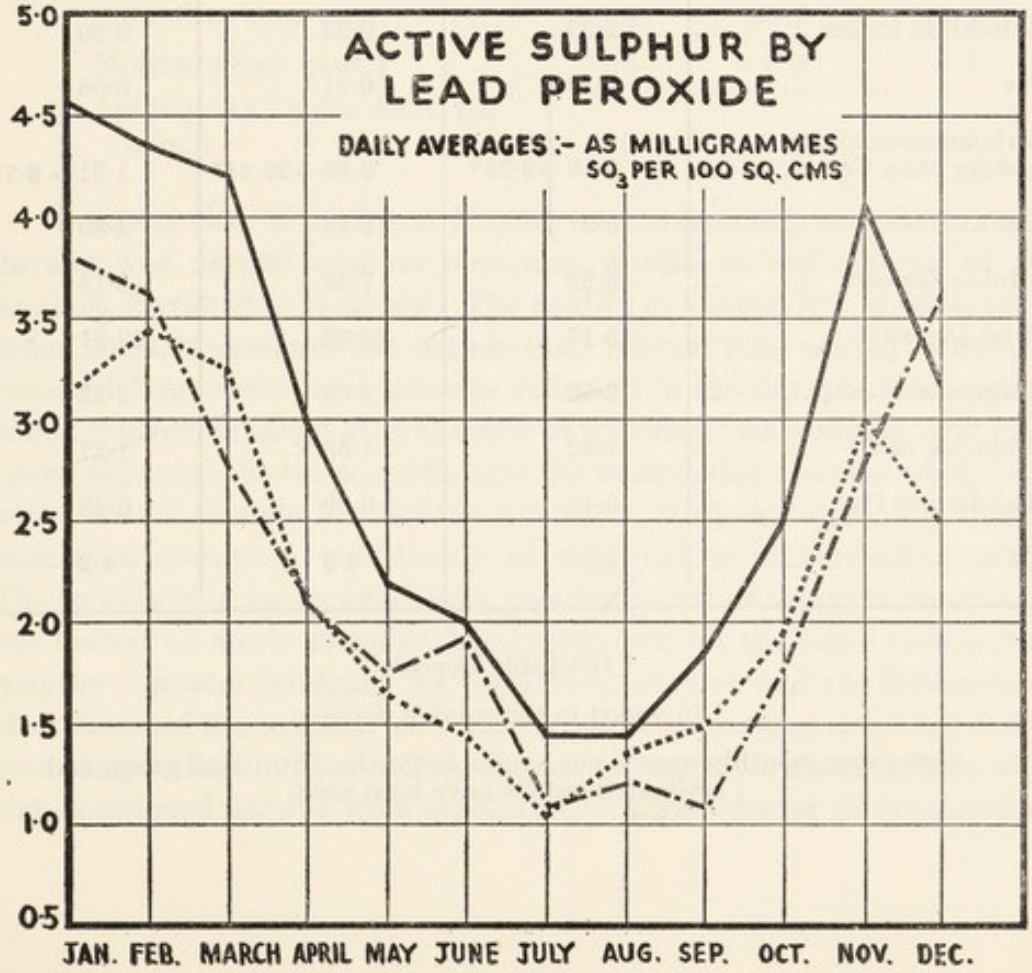


FIG. II.



and the Grammar School, respectively. The average results for the sixth complete year are given in the tables below. The rainfall for 1955 was abnormally low and due to this most of the figures for insoluble and soluble deposits, except those for calcium, are below the average values for the previous five years. The insoluble deposit and ash are, however, above average for the Town Hall site ; this is due entirely to the abnormally high figure of 85 tons of insoluble deposit per square mile recorded for April. In the previous five years the highest figure was 31·8 tons per square mile.

The sulphur trioxide figures show no decrease from the high values reported for 1954 in spite of the drier weather which would be expected to reduce the activity of the lead peroxide and thereby tend to give lower results.

Table 35.

Soot Gauge Observations, 1955.

Monthly Averages in Tons per Square Mile.

Site.	Borough of Leigh.					
	Firs Maternity Home.		Town Hall.		Grammar School.	
Rainfall in inches	2·39		2·33		2·30	
Tar	0·10	9·25*	0·21	22·24*	0·06	6·76*
Carbonaceous matter other than Tar	3·18		5·89		1·81	
Ash	5·97		16·14		4·89	
Soluble Deposit	5·92		7·32		6·15	
Total Deposit	15·17		29·56		12·91	
‡Sulphate as SO_4	2·33		2·69		2·23	
‡Chloride as Cl	1·32		1·59		1·37	
‡Calcium as Ca	0·49		0·69		0·48	
pH	4·2		4·3		4·2	

* Insoluble Deposit.

‡ Included in the soluble deposit.

September monthly results not available for the Town Hall gauge and estimated values have been used.

Table 36.

Estimation of Active Sulphur by Lead Peroxide Method, 1955.

Milligrams of Sulphur Trioxide per 100 sq. cms. Batch "A" Lead Peroxide in Louvered Cover.

Borough of Leigh			
Site.	Firs Maternity Home.	Town Hall.	Grammar School.
Daily Averages	2·30	2·90	2·20

Skimmed Milk Powder, Samples Nos. M.6594/95/96.

The first two samples, the product of different manufacturers, were submitted as the result of complaints of unsatisfactory flavour, while the third sample was regarded as satisfactory and was submitted as a control sample. All three were taken from stocks in use in School Meals Kitchens, they all consisted of spray dried skimmed milk powder and had been imported into this country. Upon analysis the samples yielded the following results :

Sample No.	M.6594	M.6595	M.6596
Solubility (per cent.) ...	99·8	99·7	99·8
Moisture (per cent.) ...	3·8	3·3	3·7
Acidity (as Lactic Acid, per cent.)	2·0	1·4	1·4

Samples Nos. M.6595 and M.6596 were chemically satisfactory, their flavour was normal and no objection would, in the opinion of your Analyst, be taken to their use. The acidity of sample No. M.6594, on the other hand, was somewhat higher than normal (the acidity should not exceed 1·7 per cent.) and this was reflected in the flavour of the sample, which was not as bland as in the case of the other two samples ; this might prove objectionable in use although the sample did not clot when boiled with water. Sample No. M.6594, therefore, while not definitely unfit for human consumption, could only be regarded as of borderline quality. The solubility of spray dried milk powder is extremely good because it is not heated as much as roller dried milk but, for the same reason, there may be a greater tendency for bacteria to survive and the freshness and cleanliness of the original milk and hygenic processing are, therefore, of great importance. Two other samples of the same manufacture as the last mentioned sample were examined and were found to be chemically

satisfactory. In view, however, of the fact that adverse bacteriological reports had also been obtained on samples from the same original source the whole of the stocks of skimmed milk powder of the same make as sample No. M.6594 were withdrawn from use.

Lard, Sample No. M.6635.

This sample was submitted in order to ascertain the nature of a yellowish-brown discolouration on the exterior of the block of lard. The brown fibreboard container in which the lard had been packed was loosely lined with colourless grease-proof paper but it was obvious from the quantity of lard congealed between the paper and the fibre-board which had soaked into and even penetrated the fibre-board, particularly at one end of the box, that the package had at some time been subjected to sufficient heat to melt the outer layers of the lard. A portion of the colourless lard warmed with a strip of the fibre-board developed a yellowish-brown colour due to dissolved colouring matter from the board. It was also found by spectrographic examination that the brown colouring matter in the board was identical with the staining on the outside of the block of lard. Analysis showed that the lard was free from prohibited colours and toxic metals. The lard was quite unmarketable in its stained condition but in view of the fact that the staining had not penetrated deeply into the block it was recommended that the stained material could be trimmed off when the remainder would then be suitable for human consumption.

Pure Home Produced Honey, Sample No. M.6644.

This formal sample was submitted in April of the year under review under the Merchandise Marks Acts by an officer of the Weights and Measures Department of Lancashire County Council in order to ascertain whether it was, in fact, home produced honey. In view of the very poor summer experienced in 1954 home produced honey was extremely scarce and it did not seem possible that it could be retailed at the price charged for this sample which was only 2s. 6d. per pound. Upon chemical analysis the sample proved undoubtedly to be honey but a microscopical examination of the pollen grains, which are always present in commercial samples of honey, indicated that it consisted mainly or wholly of imported honey, probably of Australian origin. The total number of pollen grains present was approximately 250,000 per 10 grams of honey (average English honey contains about one-tenth of this number). The predominant pollen (60 per cent.) in the honey was from trees of the Eucalyptus family. The next in quantity (30 per cent.) was that of Echium

species, common in South Australia. There were also small amounts of other very distinctive pollens, *i.e.*, Banksia, Albizzia and Acacia (both of the Mimosa family) and Leucadendron. The above pollens, amounting in all to approximately 96 per cent. of the total quantity of pollen present are all from tropical or sub-tropical trees or plants, common in Australia, which do not readily grow and, with the exception of Echium species, rarely, if ever, flower in England. Plants of Echium species while common in Australia and Canada are found only in restricted localities in Europe and England and rarely contribute to English honey. The remaining 4 per cent., or so, of pollens included varieties of compositae (thistle, etc.) found both in Australia and English honeys but no pollen of White Clover or Heather was found in the sample. The presence of such a large proportion of pollens of some six plants found mainly in Australia and the absence of significant amounts of pollens, particularly that of White Clover, from plants common in England, coupled with the large total number of pollen grains present indicated that the sample consisted wholly of imported honey rather than of a blend of imported and home produced honeys.

Legal proceedings were instituted against the vendor under Article I of Part I of the Merchandise Marks (Imported Goods), No. 3 Order, 1928, and under Section 2 of the Merchandise Marks Act, 1887, as amended by the Merchandise Marks Act, 1953, and at the hearing of the summonses he pleaded guilty. Your Analyst had, however, to give evidence as to how he came to the opinion that the sample did not consist of home produced honey. The defendant was fined £10 together with costs amounting to £10 15s. (£20 15s. in all).

Antibiotic Supplement, Sample No. M.6670.

This sample consisted of an unopened 28 lb. tin of Antibiotic Supplement for addition to animal feeding stuffs which was submitted by an officer of the Weights and Measures Department of Lancashire County Council in order to ascertain whether its actual penicillin content agreed with the declaration on the label. The Therapeutic Substances (Supply of Antibiotics for Agricultural Purposes) Regulations, 1953, relax the restrictions on the sale of penicillin made under the Penicillin Act, 1947, to permit the sale of antibiotic supplements (including penicillin supplement) for addition to pig food or poultry food provided that certain conditions are complied with. Penicillin supplement must not contain more than the equivalent of 1 per cent. of procaine benzylpenicillin, it must be supplied in a container which will preserve its potency and it must bear a label giving the following information : (*a*) the name of the supplement, *i.e.*, " Pencillin Supplement " ; (*b*) the nature of the diluent;

(*c*) the weight of the contents with the number of units of penicillin and the quantity in terms of procaine benzylpenicillin ; (*d*) the date up to which it may be expected to retain the declared amount of penicillin ; and (*e*) particulars as to storage and use. In the case of this particular sample the label stated that it contained 10 mega units of penicillin in 28 lbs. of ground chalk and the unopened tin was submitted for examination before the expiry date given on the label. The antibiotic activity was determined by microbiological assay and was found to be equivalent to only 1·6 mega units of penicillin in the whole of the tin, *i.e.*, only approximately one-sixth of the declared amount. A chemical determination of the amount of procaine present was also carried out and this was found to be equivalent to 0·017 per cent. of procaine benzylpenicillin whereas the declaration on the label was equivalent to 0·082 per cent. of procaine benzylpenicillin. Procaine is a stable substance and the deficiency in procaine, which is similar to the deficiency in penicillin, would indicate that the latter deficiency was due to failure to include the necessary amount of penicillin initially rather than to decomposition of the penicillin. The amount of antibiotic actually present in this sample was such that if the supplement was added to feeds in the proportion recommended on the label then the feeds would only contain the equivalent of 1·1 gram per ton of benzylpenicillin. Normally, the amount recommended to be included in feeds is from 5 to 10 grams per ton. When this case was eventually brought before the Court it transpired that the packer of this commodity had obtained his supplies of penicillin by purchasing antibiotic supplement, diluting it with further quantities of ground chalk and then re-selling. Legal proceedings were instituted against the packer under Section 2 of the Merchandise Marks Act, 1887, as amended by the Merchandise Marks Act, 1953, and he was fined £20 together with £14 3s. costs (£34 3s. in all).

Phenol Disinfectant, Sample No. M.6691.

This sample was purchased by an Inspector, appointed by the Lancashire County Council under Section 25 of the Pharmacy and Poisons Act, 1933, from a retailer whose name was not entered in the list of persons who are entitled to sell poisons included in Part II of the Poisons List. Upon analysis the sample was found to contain 10 per cent. by weight of phenol and its homologues (tar acids). Substances containing phenols in any less amount than 60 per cent. by weight are included in Part II of the Third Schedule of the Poisons List Order, 1953, and can, therefore, only be sold by authorised sellers of poisons or by persons whose names are entered on the Local Authority's list. The definition of phenols for the purposes of the Pharmacy and Poisons Act does not include all the substances known chemically as phenols but only

those in the homologous series of which the first member is phenol and which vary in composition from member to member by one atom of carbon and two atoms of hydrogen. Thus, phenol, cresols and xylenols are phenols for the purposes of this Act but B-naphthol and chlorinated phenols are excluded from the definition. Legal proceedings were instituted against the vendor of this sample and at the hearing of the summons he pleaded guilty and was fined £2 and £9 2s. 6d. costs (£11 2s. 6d. in all).

Raw and Cooked Carrots, Samples Nos. M.6739 and M.6740.

Both these samples were submitted by the Chief Sanitary Inspector of a County District and were taken at school canteens. The first sample consisted of raw carrots which had been peeled and then allowed to stand over a week-end (Friday to Monday) covered with water in a galvanised container ; a complaint was made that these carrots had an unusual taste and smell. The second sample consisted of cooked carrots which had previously been stored, after peeling, for a similar period in galvanised and aluminium containers. This latter sample had not been stored under water and had been boiled on the Monday in an iron vat. The samples gave the following results upon analysis :—

		Raw Carrots.	Cooked Carrots.
Lead	(parts per million)	Nil	Nil
Copper	(parts per million)	6·4	2·4
Zinc	(parts per million)	500	12
Iron	(parts per million)	5·2	21
Aluminium	(parts per million)	55	8

The recommended maximum limits for metallic contamination in most solid foods are : lead, 2 parts per million ; copper, 20 parts per million ; zinc, 50 parts per million. While there are no recommended limits for iron and aluminium the amounts of these metals naturally occurring in carrots are usually : iron, 2 to 10 parts per million ; aluminium, about 3 parts per million. It follows that the amounts of metals in the cooked carrots which had previously been stored dry are insignificant, but the amounts of zinc and aluminium present in the raw carrots which had been stored under water in metallic containers indicate very clearly that this is an undesirable practice, particularly in view of the emetic action of zinc when consumed in foods contaminated with several hundred parts per million of this metal.

In addition to the above, mention should be made of the following examinations carried out in connection with central purchasing. Nine pieces of plastic table-ware (beakers and plates) were examined for the

County Medical Officer of Health in order to ascertain if they would successfully withstand the amount of heat necessary for sterilisation. Two samples of synthetic detergent were examined for the Chief Education Officer and the results of the analyses compared with the requirements of the appropriate specification. Lastly, three samples of anti-freeze mixtures for use in the cooling systems of motor vehicles were examined for the Chief Fire Officer. The freezing points of solutions of these compounds were determined in order to ascertain the degree of frost protection afforded by their use and tests were also carried out to find whether there would be any appreciable loss of efficiency after they had been in use for some time or whether any corrosive action would occur.

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