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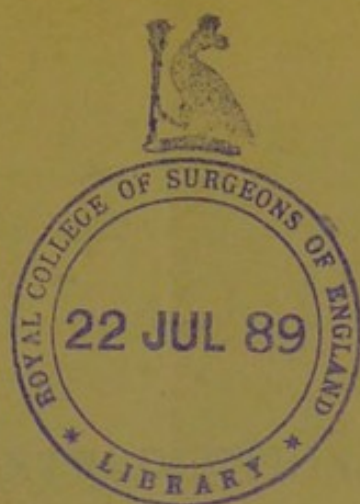
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*from the author*



13

THE FOOD OF OUR SAILORS,  
AND  
ON A SIMPLE AND INEXPENSIVE PLAN  
FOR RENDERING THE SALTED MEAT MORE  
NUTRITIOUS.

BY

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Author of "Education, Scientific and Technical; or, How the  
Inductive Sciences are Taught, and How they ought to be  
Taught," etc.



# THE FOOD OF OUR SAILORS

ON A SIMPLE AND EXPENSIVE PLAN  
FOR IMPROVING THE SAILOR'S HEALTH  
AND VIGOR

ROBERT GALLOWAY, M.D., F.R.C.S.

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Fleet," "The Food of the Merchant Marine," and "The Food of the  
Fisheries."





## INTRODUCTION.

I WAS led to write the two following articles for the *British and Colonial Druggist* owing to an article—copied from an Indian newspaper—appearing in that Journal, the writer of which endeavoured to prove that the use of common or kitchen salt (sodium chloride) is injurious to health.

I have had my articles reprinted, in the hope that I may yet be able to arouse attention to the *innutritious* character of salted meat and to a very *simple* plan for rendering it more nutritious, thereby preventing our seamen from suffering from scurvy.

The first article, on the use of common salt with fresh or unpreserved food, is reprinted because I have found that most people consider that it is used simply to render the food more *palatable*, whereas it is an absolutely *essential* food element, a disease like scurvy would, in the first instance, be produced if it were not used with fresh food; and the article likewise furnishes a good introduction to the second one.

The second treats on rendering salted meat more nutritious, thereby preventing the disease scurvy being engendered in the system of those who have to use it for any length of time unaccompanied by the use of vegetables.

It will be seen from the article that the salting causes a *disturbed* balance in the nutritive elements of the meat, some of them being removed in the brine in varying quantities. If the main element that has been removed were restored, the meat must of course be rendered more nutritious; and the prevention of scurvy, there cannot be a doubt, is to be effected by restoring to the diet the special aliment in which it is deficient, as is invariably done



when fresh meat is the diet. The aliment removed by the salting is a salt called potassium phosphate, if used with salted meat the *flavour* of fresh meat is restored owing to a *chemical change* taking place between some of the common salt and some of the potassium phosphate. This *change* is a very important one in rendering the meat more nutritious, as the different saline constituents are, by that change, furnished for producing not only healthy blood, but also healthy juice of the flesh.\* It has been said that seamen are so peculiar that they would not use this salt with salted meat; but if this difficulty should arise it could easily be overcome by the cook dissolving the necessary quantity of it in the gravy.

But the real bar to a trial of this or any other invention for rendering salted meat more nutritious is a Parliamentary enactment compelling the use of lime juice not only in our Navy but also in our Mercantile Marine, this is the obstacle to all hygienic progress in this direction. Our Legislators have in fact issued a decree that the irrational custom of giving lime juice is to be perpetual, and that no one shall have the liberty in this Country of even trying a more rational anti-scorbutic; and yet this liquid, lime juice, they compel to be used saps the strength, I have been informed by a gentleman who had been for many years a surgeon in the Navy, of our Seamen, for it acts as *anaphrodisiac*. In this age of sanitary reform are we to remain stationary in a matter which affects the health of our seafaring people?

60, PEMBRIDGE VILLAS, W.

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\* It must not be supposed that the flavour of fresh meat would be restored to salted meat which was heavily salted, it will only be restored in the case of meat that contains a moderate amount of salt.



## ON THE USE OF COMMON SALT WITH ORDINARY FOOD.

BOTH civilised and uncivilised people employ with fresh food one saline constituent, viz., common salt. It is added because certain soda salts are required for the formation of the blood: and the substances we employ as food, whether fish, flesh, fowl, or vegetable, or all combined, are deficient in the necessary quantity of the required soda salts, hence the employment of common salt with ordinary food.

So essential is it, that human beings will not only barter gold for it, but, as on the coast of Sierra Leone, brothers will sell their sisters, husbands their wives, and parents their children, to procure it. In some countries, where it is scarce, children will suck a piece of rock salt as if it were a piece of sugar. In barbarous times the most horrible punishment, entailing certain death, was the feeding of culprits on food without salt. Dr. Bradshaw, of Carrick-on-Shannon, informed me that when stationed at Sierra Leone he obtained, on one occasion, as a servant, an emancipated slave-boy. The boy came to the conclusion that his master must be possessed of great wealth, because, on arriving at Dr. Bradshaw's



residence he saw, what he considered, a large quantity of common salt in the kitchen.

Animals also require it; farmers, for instance, give their sheep rock-salt; and Bousingault has stated that animals deprived of salt, other than that contained naturally in their food, soon get heavy and dull in their temperament, and have a rough and staring coat; and Ruclin has stated that animals which do not find it in sufficient quantity in their food or drink, become less prolific, and the breed rapidly diminishes in number.

The late Baron Liebig in his researches on food showed that sodium phosphate and sodium chloride are required for the formation of the blood; and potassium phosphate and potassium chloride for the formation of the juice of the flesh; and he further showed that the sodium phosphate and the potassium chloride were furnished mainly by a portion of the potassium phosphate in the food and a portion of the sodium chloride employed mutually decomposing each other, sodium phosphate and potassium chloride being formed.

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## SALTED MEAT AND ITS EFFECTS.

CERTAIN substances go to form or constitute flesh, The composition of the flesh is changed by the



process of salting; a quantity of the albumen, of the potassium salts, of the lactic acid, and the kreatine of the flesh being removed in the brine. These substances were, of course, essential to the formation of the flesh and its juices; their removal, therefore, renders salted meat a more or less unhealthy food, varying according to the quantity of these substances removed.

Of the substances removed, the most important is, I believe, potassium phosphate. So necessary is this salt for nutrition—I might even add for vitality—that, as Pasteur and Mayer have shown in their investigations on the physiological study of fermentation and on the development of cellular organisms, this salt is absolutely necessary even for the development and nutrition of the yeast cell; for if it is absent fermentation and the formation of yeast do not take place. This potassium salt cannot even be replaced by the corresponding sodium salt, sodium phosphate being inactive.

If potassium phosphate is absolutely essential, as it has been proved to be, for the nutrition of so small a living organism as the yeast cell, what must be the effect of food deficient in this salt on human beings but malnutrition and disease?

The deficiency of this phosphate in salted meat causes, I believe, the disease scurvy in those who have to live on the meat for any length of time when the salt is not supplied at the time by vegetables or from other sources. I proposed many



years ago to render salted meat more nutritious, and so prevent scurvy, by using with it this salt, just as we use common salt with fresh meat; and if the salt is used with the meat it makes it taste like fresh meat owing to the chemical change which takes place between some of the common salt and some of the phosphate.

At the time I proposed this plan for preventing scurvy, and for long afterwards, and it may yet continue, there were cases so bad in the scurvy hospital that the nurses were obliged to raise the patients in bed by means of the sheets, for if they had raised them with their hands the skin would have peeled off; yet, although I wanted no reward of any kind if the plan were successful, I could not get the Government to try it. I suppose *red tape* said No. Even the late Dr. Parkes, Professor of Hygiene at Netley Hospital, knew so little at that time about the composition of lime juice, that he stated in the first edition of his work on Practical Hygiene that if phosphoric acid were present in the juice it must be a *falsification*. He would not at first believe, when I informed him through a friend, that the juice contained naturally potassium phosphate.

It must not be supposed that scurvy has altogether ceased to be a disease even in the Royal Navy since tinned meats have become so extensively used as the food supply; for even the last Arctic expedition, which was fitted out at great cost to the nation, was



obliged to return prematurely because the men became so enfeebled by scurvy the commanders of the expedition believed it was not safe to remain any longer in those ice-bound regions.

The beneficial action of lime juice is greatly due, I believe, to its containing potassium phosphate. If its beneficial effects are mainly due to the presence of this salt, would it not be more rational, as well as more in accordance with an every-day custom, to employ the salt with the meat, thus rendering the meat more nutritious and appetizing, than to *compel* seamen to swallow a liquid containing it some time after the meat has been partaken of in order to ward off disease.

Disease, I have shown in the previous article, is produced if common salt be not employed with fresh food. Which of the two courses would be considered the most beneficial and health-giving, to take, as is universally done, the salt along with the food as a food constituent? or to take a solution of it some time after dinner, or other meal as a dose of medicine? the first and rational plan, has been adopted in all countries, and without the slightest knowledge of the "Chemistry of Food;" why, in this scientific age, should so barbarous a custom be followed as that of administering lime-juice to those who have to live on a salt diet. Yet this barbarous custom is enforced in this country by an Act of Parliament, so that the owners and managers of our mercantile marine are *compelled* to give their seamen



18