

SCHEME TO PROTECT NATIVES

EVILS OF MALNUTRITION AND OVERSTOCKING

By H. WATKINS-FITCHFORD, CMG., F.R.C.V.S., F.R.S.E.

The following suggestions are framed to meet in some degree the increasing menace of land erosion on grazing areas in Native locations, with the attendant evils of poverty of stock, lessening of milk yield, and the present state of malnutrition among the Native peoples of the Union.

From official statistics it will be seen how the resources of the Native have decreased progressively of late years, and in this connection attention is drawn to a striking article appearing in "The Natal Mercury" from the pen of Mr. G. D. Alexander, on April 6 of this year—incontrovertible figures of grave import to South Africa.

The following suggestions do not attempt to do more than outline a project for ameliorating the present evils of overstocking and malnutrition. Success of the project will depend upon the co-operation of the Government with private enterprise, such as a public company would afford.

The scheme outlined herewith seems to show that not only can the present evils of overstocking be reduced gradually to reasonable proportions by an annual withdrawal of a small percentage of the existing stock (such as 5 per cent), over a short period such as five years, but the food value of the animals taken from the area will be returnable to the Native himself in an endeavour to reduce the more pronounced cases of malnutrition existing in the area in question.

EXPERIMENT SUGGESTED

Such a system, it is suggested, should be applied at first on a restricted and experimental scale to one or more locations in Natal where the need appears greatest, and if within the first year, as is confidently expected, the benefits of the scheme appear assured, such project can then be extended to wider areas throughout the Union.

No great objection on the part of the Native himself to such a system would, it is thought, be encountered, as the benefits both physical and material, would become early apparent to him, in addition to the prospect of opening for him a market—at present non-existent—for the disposal of his surplus stock at a reasonable figure.

In this manner within a few years (such as a five-year plan would comprise) the destocking by an annual withdrawal of only 5 per cent. of the existing cattle, would reduce the cattle population to such numbers as the location grazing grounds could reasonably carry, and no increase above such figure would be admissible thereafter.

Such measures would naturally go hand in hand with some organised system of land reclamation, a policy which would give promise within five years of wide application, of readjusting a pastoral problem at once so weighty and so baffling.

GENERAL USE

The greater number of the animals thus withdrawn under the project would be returnable to the area whence they were taken in the shape of canned, or processed (desiccated) meat, to be consumed as articles of everyday diet, purchasable by the Native at actual cost price, or issued under some scheme of free dietary to the most needy cases.

This processed meat (in the form of a meat powder for mixing in the porridge) while containing the full protein nutriment of meat in a fresh state, would be more readily dispensed and distributed than fresh or canned meat, besides being more likely to ensure impartial distribution if dispensed from the kraal porridge pot.

In cases where malnutrition was marked the specially prepared Nutresco Preparations would be available, such articles being produced by the company from a percentage of the meat, and being eminently adapted for the purposes of a malnutrition campaign.

These Nutresco Preparations would be supplied by the company during the continuance of the preliminary observations at actual cost plus a percentage of profit to be agreed.

On the adoption of such a plan, some of the most pronounced cases of malnutrition would be directly met, and at the same time the problems of destocking and land repair would be attacked, a policy which within a short term of years would lead not only to the rehabilitation of the Native and the improvement of his cattle, stocks and lands, but—as an important corollary—would tend to bring about a lessening in the incidence of tuberculosis.

GRADUAL APPLICATION

Such a project, it is thought, could be carried into effect by the Native Affairs Department without great

cost and on gradually widening lines. Application of the system to restricted areas—such as one or more locations—at first, would afford evidence as to the value and the better application of the system.

That remedial measures in the case of the ill-nourished and sick among the Native people constitute a proper charge against the Government will hardly be disputed, if only on grounds of expediency. The project under consideration, while attacking the evil of overstocking at its root, will at the same time place at the disposal of the authorities appropriate remedial agents at the lowest cost possible, and this without alarm, harshness, or disturbance of Native interests such as have attended destocking endeavours in other countries such as Kenya.

It is not suggested that the scheme as outlined here would suffice to meet all the requirements of a malnutrition campaign, nor is it designed to meet all the requirements of destocking or land reclaiming policies, inasmuch as sheep and goats—the worst offenders in land erosion—would have to be reduced in number by other appropriate measures.

It is, however, suggested that the project here put forward would meet the main requirements of both problems of malnutrition and destocking, making possible schemes for land reclamation.

OMINOUS INCREASE

From the statistics illustrating the article mentioned above, it would appear that the cattle stocks of the Native have increased within the last 14 years by nearly 21 per cent., and this in spite of the annual toll of drought and disease—an average annual increase of about 1.3 per cent.—an ominous increase considering the restricted and rapidly deteriorating grazing grounds of our locations.

To reduce such grazing areas to their carrying capacities of 20 years ago (when the evils of overstocking were even then becoming apparent) it would be necessary to reduce the total cattle stocks of a given area by 5 per cent. each year for a term of five years.

This 5 per cent. levy would suffice to absorb the annual increase of 1.3 per cent., and would serve to reduce cattle numbers on a given area by 23 per cent. within a term of five years, at which point the number would be kept constant by the adjustment of the annual figure of withdrawal.

Such withdrawal of 5 per cent. of the cattle of an area would be accompanied by the prompt payment to the owner of a fair purchase price of say 15s. per 100lb. dressed weight.

In such way sales would become possible for such Native stock which would have no prospect of disposal upon the open market—"butcher condition" being unnecessary (and even undesirable) for the purpose of manufacturing the Nutresco meat foods above mentioned.

CONCRETE EXAMPLE

A concrete example will help to show the working of the project.

If an area where overstocking was marked, contained say 48,000 head of Native cattle, a 5 per cent. withdrawal (2,400) could be made in batches or drafts of 50 head, which could be collected at some centre convenient for transportation by rail to the abattoir and works, where 10 head a day (for a week of five days) would be handled.

The weight of such cattle as would be accepted under the plan would average about 700lb. live weight, which would give a dressed weight of from 350 to 400lb., upon which weight payment would be made by the Government, to whom also the charges for transport, rendering-down, conversion into meat products, repacking, etc., would be chargeable.

Such cost, which would be in the region of 75s. per head, less 25s. on account of sales, hides, bones, etc., would reduce the total cost to the Government to about 50s., and against this figure would be placed the value of the finished products derived from 350lb. of bone-free meat either tinned, as desiccated meat powder, Liebig's Extract, and the nutritive Nutresco Products, thus affording a wide range of meat preparations for issue or sale in the area from which the cattle were taken.

Such meat preparations would be produced at the Company's works, where this weekly quantity of about 35 cwt. of dressed beef would be canned or processed ready for issue by the authorities; free issues being made where advisable but payment (at cost price) being required from other Natives within the area.

The cost of such free issues would be chargeable to the malnutrition and destocking items borne upon the estimates of the department concerned.

UNDER CONTROL

In this manner cases of pronounced malnutrition could hope to be brought under control, while the highly nutrient Nutresco Preparations would be compounded from the Native's own cattle; although many of the preparations in question contain other essential food principles in addition to the protein or meat principle.

The main advantages of the project from the Government's point of view would be the ability to command a supply of nutrient preparations for a malnutrition campaign at cost price, the progressive destocking of the overcrowded location grazing grounds, and the facilities thereby afforded for reclaiming the evils caused by close grazing and land erosion.

In the point of view of the Company the advantages of such an arrangement for handling and converting the cattle for Government use, would lie in the increased volume of work of a regular nature passing through the Company's factory as well as in the increased turnover of Nutresco Products which could be anticipated as the campaign attained the semi-national proportions it seems likely to assume.

The adoption of some small and preliminary scheme such as is suggested above is here submitted for consideration as a first step designed to show the advantages and benefits to be expected from a comprehensive and general campaign against evils which are rapidly assuming proportions when State action will become imperative and can no longer be delayed.

A suggested Contribution to the efforts now being made to repress the disease TUBERCULOSIS in the Union of South Africa.

(Embodying suggestions also for enhancing the value of the diet of Indigents, Children, &c as well as of affording relief in states of Malnutrition, Convalescence, &c.

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(1) In venturing upon these suggestions the writer may say that he has been associated in the past with questions of Tuberculosis-eradication (so far at least as Bovine tuberculosis has been concerned) having been instrumental in promoting, and later in drafting, the Natal Tuberculosis Enactment of 1899, this -the first anti-tuberculosis legislation in South Africa it is believed- providing against the introduction of this disease into Natal, as well as for its detection by the use of Tuberculin (many thousands of doses of which were made and issued from the Laboratory of which the writer was the first Director, and where during his time some of the earlier observations as to the essential differences between the various types of the Bacillus tuberculosis -human, bovine, and avian- were also made or confirmed.

(2) The present organised effort at eradication and control of Tuberculosis throughout the Union is therefore of interest to one who ventures to put forward the following suggestions -not as concerning questions of eradication or repression directly, but aiming rather at increasing the resistance, and bringing about some degree of amelioration of those cases of indigent Europeans, Natives, and especially their Children- who are already infected and who at present are handicapped in their fight against the disease by an insufficient or unsuitable dietary.

(3) Without presuming to express any opinion in favour of an increase of the Protein principles of the tubercular diet, it will be conceded readily that any enhancement of the nutritive value of such diet -provided that its assimilation is at the same time well assured- is a desirable step and one of importance in the treatment of the individual case.

(4) It may be remembered that recent research at the famous Carnegie Institute and elsewhere confirms the theory that the ingestion of a proteid food is attended with a much greater increase of metabolism in the body-processes ('body-building' and repair) than attends the ingestion of other food-stuffs, and that these increased metabolic effects are sustained after a meal rich in protein for many hours longer than is the case with the carbohydrate food-principles- it being concluded that the proteins have a 'specific influence' in stimulating the whole cellular system to greater activity. Other research-workers (notably those at the Johns Hopkins Hospital) have shewn that blood-regeneration and replacement of lost tissues will depend markedly upon the degree to which meat-proteins are present in the diet, such regeneration being rapid on a diet rich in proteins while on a diet in which the carbohydrate principles preponderate, regeneration is markedly lower.

(5) That this protein principle in the diet of the indigent White and especially in that of the Native sufferer from Tuberculosis, is the principle most frequently deficient, will be readily admitted, and it is in an endeavour to supply this deficiency in the diet of such tubercular sufferers, that the writer has ventured to submit the following suggestions thinking them adapted to meet this particular need.

(6) By the writer's process - perfected only after many years of laboratory observation and factory working - it is now possible to produce economically and in bulk, Beef in so concentrated and digested a form that only 17% of its original weight remains as a pure protein residue, containing as to two-thirds of its weight, a

form of semi-digested meat- Plastein- soluble in both acid and alkaline solutions, and much more readily digested by the pepsine of the stomach than the Myosine of ordinary cooked beef; while the remaining one-third exists in the form of Peptones, completely soluble and capable of immediate assimilation- these being the half-way and end-products respectively of the normal gastric and pancreatic digestion- with which end-products they are in all respects identical- conclusions which will be seen to have been verified by many competent analytical authorities.

(7) That a remarkable enhancement of the nutritive value of the original beef takes place in this manipulation has been shewn in many experiments, and in none more strikingly than in the experiments made by the professor of Biological-chemistry at the University of Lyons, with the material in question. The accompanying chart illustrates only one of his many experiments but it serves to justify his final conclusion that the meat-powder in question is 'an alimentary matter of the very first order'- ('tout premier ordre')- even in the presence of a grave gastric lesion.

(8) Clinical evidence as to the great nutritive value of these forms of concentrated and digested meat in the case of the human being, has indeed followed their use in all cases- the most striking evidence to this effect being perhaps the (unsolicited) testimony of the head physician in charge of the 'Save-the-Children' Clinic -established by a world effort in Vienna after the late War- to whom several hundred weights of these "Nutresco" meat preparations (in the form of the meat-powder, toffee, and nutritive malt-extract) had been forwarded from London for treatment of the most urgent cases of malnutrition.

(9) Such instances are quoted merely to shew that the suggestions now put forward are based upon data and practical findings such as are capable of being immediately applied on an extended scale to the needs of tubercular patients in this country, or those suffering from mal-nutrition.

(10) The technical evidence indeed as to the nutrient value of the "Nutresco" Preparations is so conclusive that no further detailed trials or clinical observations are called for, and these valuable Products can be made available for use within a few weeks without the delay attending the repetition of analyses (so often undertaken) or further clinical experiment- this so-called experimental or 'laboratory'- stage having long been passed.

(11) Some of the points which may be claimed for this form of concentrated protein feeding are as follows:-

- (a) Extreme digestibility rendering assimilation easy when other forms of protein food are digested only with difficulty or not at all.
- (b) Absence from its composition of all fats, salts, and extractive matters- such as creatine, xanthine, &c.
- (c) The manner in which it can be incorporated in a large range of dietetic and comestible preparations, both fluid & solid- a range comprising such diverse articles as biscuit, wine, toffee or chocolate on the one hand to porridge, beef-tea, and nutritive malt-extract on the other- all containing the tasteless and digested protein-principle of Beef.
- (d) Its non-putrescible nature- except in the presence of an excess of water.
- (e) Its stable nature under all ordinary conditions of storage for indefinite periods.
- (f) The degree of concentration in which this meat-principle exists rendering it easily available both for dispensing and transport.
- (g) The exactness with which the Physician is able to re-inforce or reduce the protein-content of a diet.

An example of the every-day use of the meat-powder e.g. would be as follows:- Half-a-tablespoonful (14 grammes or 1/2 onz) of the powder 'Pulvesco' sprinkled into 65 grammes (two full tablespoonsful) of mealie-meal, will serve to nutrify or enhance the protein value of the resulting plate of porridge to the same extent as

would an addition of 2½ ounces of minced fresh beef, with the difference that the meat-powder demands little or no digestive effort on account of its pre-digested state, while its freedom from all extractives enables a larger protein ration to be allowed, without the drawbacks attending an excess of the usual meat-bases- thus permitting that degree of 'high feeding' so often beneficial in tubercular conditions.

(12) It can be shewn that in this form of digested beef over 30% of its weight is secured in the form of a perfectly digested and soluble extract consisting of true beef-peptones. This extract which is semi-solid, compounds admirably with the usual extract of malt, being undetectable when blended, either as regards appearance or flavour. The protein-content of this ('Maltesco') preparation can be adjusted with ease making the resulting Extract one of unique feeding value and an ideal pharmacological food-preparation such as has not hitherto existed. The further addition to this compound-extract of a hydro-carbon component, such as cod or halibut oil, enables a balanced ration to be arranged with ease, thus combining all the essential food-principles- or by the substitution of butter in place of cod or halibut oil, a palatable sweetmeat or toffee is made available for children.

(13) Regarding the widely advocated use of Milk as a staple diet, and without decrying its unique value for infant feeding, the writer suggests that there exists no scientific evidence in support of the claim that the proteins of milk either take the place of, or are of as great value to the adolescent and adult as the widely-differing proteins of ordinary meat; growth and tissue repair, after infancy, being supported and maintained rather by myosine and the meat-proteins than by those of milk. Apart from such considerations of every-day experience, the draw-backs attending the use of milk- its risks of contamination and difficulties of distribution and purveyance &c are absent in the case of the digested meat-powder in question.

(14) It is to the food-values of these preparations -especially to the digested beef-powder 'Pulvesco', the meat-malt-extract 'Maltesco', and the Nutresco 'Invalid Food'- that the writer asks attention, believing that these preparations can be placed -at a minimum of cost- within the reach of every tuberculous patient in the Union of South Africa, for whom such preparations may be considered suitable. In the illustration given above -that of a mealie porridge nutrified with 'Pulvesco'- half-an-ounce of the digested meat-powder would suffice to enhance greatly the food value of this meal. If the manufacture of Pulvesco were undertaken in the interests of those indigent people whose health it is desirable to improve by a more balanced diet, the cost of this half-ounce should not exceed 7/8ths. of a penny. Such feature of 'cheapness' is shared indeed by all the other products; the costings of which have accurately determined by production in bulk under factory condition.

Note:- Fourteen grammes of this 'first-class protein' matter is, it is true, only 38% of the protein requirement of the average adult (as laid down in the recent Report on Nutrition issued by the British Medical Association). This amount however would supplement the existing diet to a considerable extent, while two such portions (at the cost of about 1 3/4d.) would probably more than meet the daily protein requirements of the average adult as an augmentation of his ordinary diet.

(15) If it is accepted that the Protein factor is one of first importance in a tubercular dietry, our South African resources in this direction are superabundant, it being practicable to place such preparations as those described above within the reach of every indigent tubercular sufferer in the Union and -it is hoped- widely elsewhere.

(16) The Project which the writer thus submits for consideration is one which would make practicable the supply of these Preparations in bulk to Anti-tubercular Associations, Clinics, and Sanatoria, at actual cost of production, arranging to meet overhead expenses of sustentation, administration &c by the sale to the general public of such Preparations at ordinary competitive prices. Such project

Concerning the meat-powder -"PULVESCO"- referred to above, the following Medical and Analytical testimony may be quoted:-

The LANCET:-

" 'PULVESCO' is derived directly from meat by an approved hydrolysing process and has a special food value."

The MEDICAL PRESS:-

" We fully endorse the nutrient qualities claimed for this preparation."

ANALYTICAL AND CONSULTING CHEMISTS to the IMPERIAL GOVERNMENT.

" This preparation is characterised by the presence of a large proportion of soluble proteins- nutritive and flesh-forming- in a pre-digested form readily assimilable, thus possessing a high food value."

FRENCH BIOLOGICAL CHEMIST:-

" 'PULVESCO' is of extreme food value when used in wasting diseases."

&c. &c. &c. &c.

All the Nutresco Preparations carry the following Guarantee:-

It is GUARANTEED that this article contains, in a concentrated and digested state, its own weight of fresh Beef.

the writer is confident could be carried into effect if the Organizations and Associations concerned participated in the -very moderate- capital cost of bringing into existence the machinery necessary for initial production.

(17) Such cost-price could be made so low as to bring the Nutresco Foods within the reach of even the most indigent tuberculotic of whatever race or colour. Actual 'costings' have been prepared in detail and are available for scrutiny. The writer for his part is prepared not only to place his Process at the disposal of such a project but will undertake the production of the Preparations in question. Such scheme could, if entertained, be discussed between the writer and any official or sub-committee deputed to enquire into further details after the Medical authorities concerned had satisfied themselves that such enquiry was warranted.

(SGD.) H.WATKINS-PITCHFORD.

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Notes for the Information of Physicians.

(a) Re Method of digestion of Beef. There is nothing empirical in the method by which this form of digested beef is prepared- of which fact the writer is confident he will be able to convince any Medical man sufficiently interested to discuss the subject.

(b) Re Protein content:- A high protein-content exists in several foods now before the public, e.g.:-

OVALTINE- contains 14.3% protein (i.e. 1 to 5)

Malted Milk, (Horlick) contains 14.3%

BENGER & MELLIN's Foods contain 8.3% respectively.

SANATOGEN contains 95% protein in form of soluble Casein.

BIOGEN (Callard) a Cocoa containing 43% protein.

CELLULON BISCUIT (Callard) contains 51.8% protein.

&c.

&c.

&c.

So far as the writer is aware no one of these preparations can claim any degree of pre-digestion of its protein-content, soluble Casein being the usual, if not sole, protein constituent- with the exception of the unaltered ovalbumen of OVALTINE. The factor of 'solubility' does not of course connote any proteolytic change in the casein or albumen present in these preparations.

(c) Re Digestibility of Plastein (meta-protein) as compared with Myosine or Ovalbumen.

A striking difference in digestibility was shewn by Prof. "E.B." of the Bio-chemical Dept. of Lyons University, who, in parallel experiments (in which he used pepsin in the presence of .2 HCl) took equal weights of (1) Cooked beef, (2) Coagulated white-of-egg, and (3) 'Pulvesco' the meat-powder in question from which its fully-digested peptone principles had been removed by washing, so leaving the semi-digested Plastein.

(d) Re 'Carnesco' the completely-digested component of the meat-powder. 'Carnesco' when removed from the meat-powder by solution in cold water and concentration in vacuo becomes a clear viscid extract composed solely of beef-peptone and fully-digested meat-principles. This extract can be further reduced to an amorphous powder readily soluble in cold water. The extraordinary stable nature of 'Carnesco' is shewn from the fact that some of this extract, shipped from Durban in 1915 remained stored in a cellar unchanged and undeteriorated for twenty years in wooden casks.

(e) The Ultimate or End-products (amino acids) resulting from the digestion of these preparations are those of Beef only:- (Glutamic acid, Leucine, Lysine, &c.) no proteins of vegetable or other origin being present.

REPORT UPON THE PITCHFORD NUTRESKO PROCESS FOR THE PRODUCTION OF A WIDE RANGE of NUTRIENT SUPER-FOODS

Nutresko Process.

Under the Pitchford Process of Nutritive Extracts, instead of the utilisation of only 3 per cent. of the meat employed, as in the "Liebig process," the whole of the meat is digested and brought into the form of a perfectly tasteless and highly nutritive product, "Pitchford's Extract," which is

capable of being incorporated with a whole range of foodstuffs, such as wine, stout, biscuits, chocolates, malt extract, invalid foods, beef tea and several pharmaceutical and veterinary preparations,

all of which are greatly enhanced in their nutritive character by the addition of this digested form of beef.

The following are some excerpts from reports by the leading British organs concerned with the medical profession.

Incorporated Institute of Hygiene, England.

The Incorporated Institute of Hygiene granted certificates stating that the following products had been passed by the examining board of the Institute as fulfilling the standard of quality and merit required by them:

Invalid wine.	Beef tea.	Meat powder.
Nerve food.	Syrup of peptones.	Malt extract.
Invalid biscuits.	Invalid food.	Chocolates.

and commented as follows:

"The basis of these preparations submitted for our analytical examination and tests is beef made soluble by an approved process of Hydrolysis. These products provide a maximum of the nutritive properties of meat. The presence of the assimilable peptones and albumoses (predigested proteid) enables the foods to be absorbed into the system with a minimum of digestive effort.

"For invalids and old people whose digestive activity has been diminished by debility, as well as under conditions of great mental and physical strain, the wine, beef tea and malt extract will be found of much service. They may be accepted with confidence as pure preparations entirely free from artificial preservatives."

The Medical Press and Circular.

"So widely has the net been spread for meeting the food requirements of the invalid, the athlete, the brain worker, and, indeed, all classes of the community,

that the area of the usefulness of the products is practically unlimited.

The basis of the products is a newly-devised scientific process by which the proteid matter of fresh prime beef is rapidly converted into peptones and albumoses—that is to say, ready for immediate assimilation in the stomach, thus anticipating the process of digestion. The advantages, therefore, and value of these products are obvious. Moreover, analysis has shown their purity. They are free from preservatives

and their standards as nutrients we consider to be exceptional."

Messrs. Harrison & Self, Analytical and Consulting Chemists for the Imperial Government.

"We have analysed and critically examined several of the principal preparations, including the wine, and we have found them all to be characterised by the presence of a large proportion of soluble proteins (albumoses and peptones). These nitrogenous substances, as is well known, are the nutritive or flesh-forming constituents of meat foods in a predigested form and therefore readily assimilable, and their presence in large proportions confers a high food value on the articles containing them.

"These preparations contain much larger quantities of soluble proteins than are present in any corresponding products of other makes of which we are acquainted."

Invalid Wine.

"The exceptional value of this product is that it is a food wine and not a medicated one. It differs from the ordinary beef extract wines claimed to be nutritious in having had the extractive matter removed and in containing the active nutrient principles of beef in the form of albumoses and peptones. Approximately, the soluble protein nutrient amounts to 3 per cent. We believe this to be a real food wine of high standard."—("Medical Press and News.")

Malt Extract.

"We have recently examined a mixture of malt extract from peptones and albumoses prepared from beef. Analysis shows it to contain the very high proportion of 21.6 per cent. of protein. It is evident that the food value of such a product is high, and since it contains about four times as much albuminoid substance as an ordinary malt extract with cod-liver oil it should prove valuable as a nutrient."—("British Medical Journal.")

Beef Tea.

"This is a beef extract but, unlike the majority of beef extracts, it is rich in nutritive proteoses. It is of high nutritive value, as well as stimulating, appetising and restorative. It is of decided advantage in comparison with the greater number of ordinary malt extracts which, although acting as temporary stimulants and energisers, are deficient in nutriment."—(Institute of Hygiene.)

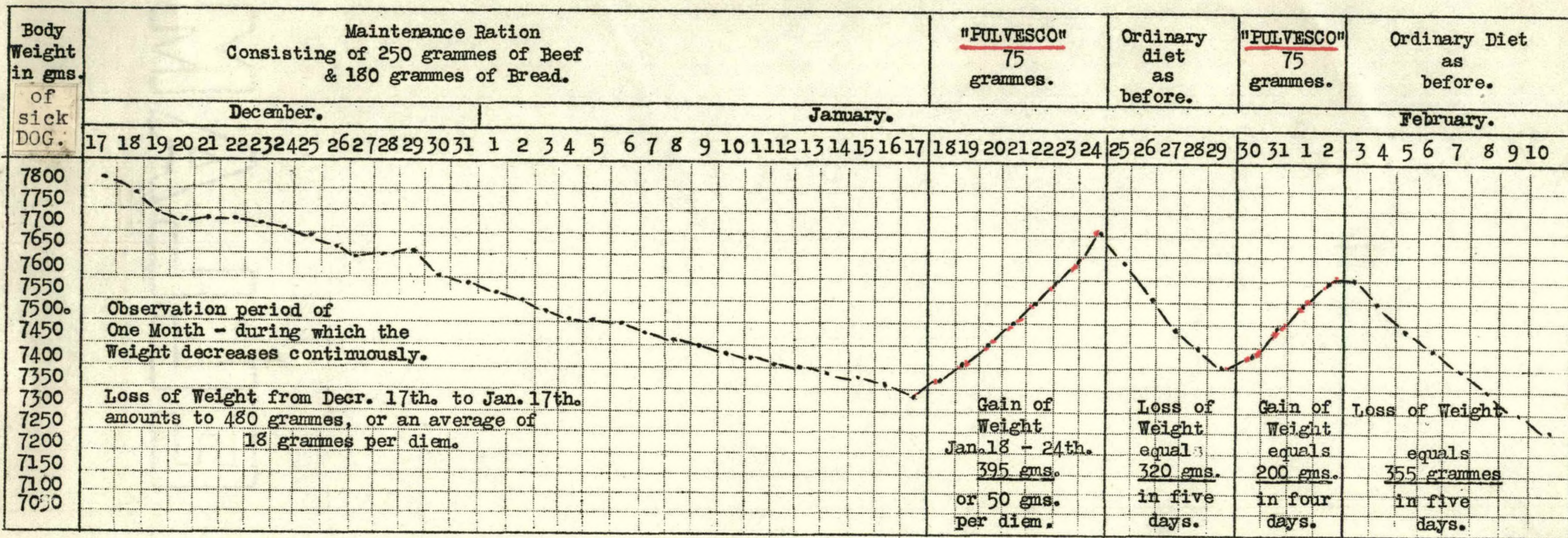
"I certainly know of no products which give nearly as large a figure as these. There ought to be a future for these products—they are very palatable."—(Public Analyst of a Large English City.)

"The conspicuous feature is the presence, in addition to other protein contents, of an exceptionally high proportion of albumoses and peptones. It thus provides a means of preparing beef tea which is nutritive as well as stimulating."—("British Medical Journal.")

A CHART ILLUSTRATING THE REMARKABLE FOOD VALUE OF THE "NUTRESCO" PREPARATION.

"PULVESCO"

A digested Meat Powder.



N.b.

The figures of Gain (395 & 200 grammes) and those of Loss (320 & 355 grammes) are the actual weights recorded by the French bio-chemist at Lyons University. The dotted-line is diagrammatic and is less striking than the actual figures.

DEATH.

Post mortem examination revealed Carcinoma of Stomach.

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