Emulsifying Agents

Another method of economizing in oil is to incorporate an emulsifying agent in the ointment base. The following formulae have been tried:

	Parts
B Paraff. moll.	25
Octadecyl alcohol	2-4
Diethylene glycol distearate	2.5-5
Sodium cetyl sulphate (15% paste)	1
Water	22-26

This emulsion must be kept in a closed container to avoid evaporation.

B Tetraethenoxy-cetyl alcohol	10-20 g.
Paraff. moll.	ad 100 g.

B Cetyl alcohol — 4 mols	
ethylene oxide	40
Cetyl alcohol	40
Sodium cetyl sulphate	20
Paraff. moll.	ad 100 g.

} parts, of this 10-20 g.

To these preparations may be added any of the ingredients commonly incorporated in the ointment bases—i.e., zinc oxide, ichthammol, mercury, sulphur, etc.

These three formulae have been used with the addition of 15% zinc oxide and an active ingredient such as ichthammol or ammoniated mercury in the treatment of a sufficient number of eczematous skin eruptions to give convincing evidence that they fulfil the same conditions as regards suitability as was found in the case of the cleansing agents. To remove these preparations from the skin no oil is required, and considerably less soap is used than is necessary when a cleansing oil has been applied before the soap and water in the removal of an ordinary paste base; sometimes it is possible to dispense with soap altogether.

Comment

In the case of the cleansing agents, oil and soap are dispensed with; in the case of the emulsifying bases, oil is not necessary and little or no soap is used. The extent of the economy which might result from the employment of these preparations or others of similar nature can be judged when the oil and soap consumption of a large department for the treatment of skin diseases is examined. The weekly requirement in one such department containing 60 beds and catering for the daily treatment of from 20 to 30 out-patients referred from the consultation-room is about 400 oz. of oil and 12 lb. of soap. In addition to economy in actual material there is a considerable reduction in the time required to carry out treatment. To prepare for a bath a case in which a paste has been applied to the entire body surface at least half an hour's work with oil is necessary, and at least part of this operation requires the services of a nurse.

Finally, the removal of ordinary pastes necessitates a considerable amount of friction, which has some temporary deleterious effect on the course of an eczematous eruption. The employment of either type of preparation described above obviates this drawback.

My thanks are due to Imperial Chemical Industries (Pharmaceuticals) Ltd., Manchester, for the preparations used in this investigation.

THE BREAD FACTOR IN A WARTIME HUMAN DIETARY

BY

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Contradictory statements have appeared in the literature as to the merits or demerits of national wheatmeal bread and of the proposals to fortify this bread with calcium in the form of creta praeparata or white bread with aneurin (vitamin B₁) and calcium in the same form. It was thought, therefore, to be of interest to record the results of some feeding experiments recently carried out with rats.

The experiments were designed to determine the effect on the growth of young rats of substituting national wheatmeal bread or fortified white bread for the ordinary white bread in the basal diet. This basal diet was drawn up from the results of a dietary survey carried out in a North of Scotland town

in the spring of 1941, and represents the average diet of a number of families spending up to 7s. per head weekly on food. The rats' basal diet contained all the various foods in the proportion in which they were found in the human diet. The methods used in the preparation of the food, which was in all cases fed *ad lib.*, were similar to those described for an earlier dietary experiment at this institute (Orr, Thomson, and Garry, 1936). Since "fortified" white bread was not available in this part of the country, white bread supplemented with chalk and aneurin in the proportions officially proposed was employed for this purpose.

Experiment I

In the first experiment six groups of rats were used, and the diets and weight increases for each group over a period of eight weeks are shown in the accompanying table. The

Table showing Diets and Weight Increases for Experiments I and II

Group	Diet		Males			Females		
	Type of Bread	Supplement	Initial Weight	Weight After 8 Weeks	Average Weekly Gain	Initial Weight	Weight After 8 Weeks	Average Weekly Gain
			g.	g.	g.	g.	g.	g.
Experiment I								
1	White	—	42.4	191.9	18.7	40.4	149.4	13.6
2	N.W.M.	—	44.6	208.4	20.5	40.2	151.1	13.9
3	White	Ca + aneurin	43.7	228.2	23.1	42.1	168.0	15.7
4	N.W.M.	Ca	42.6	231.3	23.6	41.1	165.5	15.6
5	White	Vitamins + minerals	43.7	227.3	23.0	40.8	166.9	15.8
6	White	Ca	40.3	205.9	20.7	38.5	156.7	14.8
Experiment II								
2	N.W.M.	—	40.5	208.2	21.0	39.5	157.9	14.8
3	N.W.M.	Ca + aneurin	40.3	242.7	25.3	39.5	186.4	18.4
4	N.W.M.	Ca	40.3	246.9	25.8	39.9	183.6	18.0
5	N.W.M.	Vitamins + minerals	40.3	259.1	27.4	39.2	192.5	19.2

rats were given their respective diets at weaning, approximately half of them being taken from the stock colony, the others being the offspring of parents which had been reared on the corresponding experimental diets in a preliminary experiment. Each group contained 14 or 15 males and 15 females, the sexes being caged separately. The mineral-vitamin supplement used in Group 5 contained calcium, phosphorus, iron, and vitamins A, B₁, and C in amounts such as would, if fed in proportion to the quantity supplied to the rats, have brought the daily intake of the members of the families surveyed up to Ca, 1 g.; P, 1.3 g.; Fe, 15 mg.; vitamin A, 4,000 I.U.; vitamin C, 1,500 I.U.; and vitamin B₁ 390 I.U. (i.e., ratio to calories 1:5).

The figures show that for the male rats the average weekly gain of 18.7 g. in the control group has been increased to 20.5 g. by the substitution of national wheatmeal for white bread. A similar increase (20.7 g.) was found in the group which received white bread with a calcium supplement. A greater improvement was found in the groups which received both additional calcium and vitamin B₁, whether the B₁ was given as aneurin or as national wheatmeal bread. In these groups the average weekly gains were 23.1, 23.6, and 23.0 g. Similar results hold also for the groups of females, except that the substitution of wheatmeal bread for white had little effect on the rate of weight increase. The marked improvement caused by simultaneous addition of calcium and vitamin B₁ was again observed.

Experiment II

Experiment II was intended to be a second-generation repetition of Experiment I, all the young rats in this test being the offspring of animals used in the growth tests just recorded. Unfortunately white bread was no longer available, so some modification of the groups was necessary. It was decided to test the effect of increasing the ratio of I.U. of vitamin B₁ to calories by adding extra aneurin. In Groups 2 and 4, which correspond to the groups of the same numbers in Experiment I, this ratio was 1:4.33. The amount of aneurin used as supplement for Group 3 brought this ratio up to 1:3, and the ratio for Group 5, with a mineral + vitamin supplement as in Experiment I (but with the complete B complex instead of B₁ alone), was 1:4. In this experiment each group contained 17 or 18 males and a like number of females.

The figures for the weekly gain in weight again show the beneficial effect of the calcium supplement. Thus for the males the average gain of 21.0 g. on the unsupplemented ration was increased to 25.8 g. by the addition of calcium, while for the females the figures were 14.8 and 18.0 respectively. The increased amount of aneurin given to Group 3 had little or no effect on the growth of the rats. The best response was shown by the animals in Group 5, which received the complete vitamin-mineral supplement. Here the gains averaged 27.4 and 19.2 g. for males and females respectively; but the greater part of the extra increase was undoubtedly due to the added calcium, as is shown by comparison with the results for Group 4.

Comment

These results point quite definitely to the fact that the addition of calcium to this diet in the amount which it has been proposed to add to national wheatmeal flour does not produce any harmful results, but, on the contrary, tends definitely to enhance the value of the diet as measured by the live-weight increase of young rats. On these figures there is no evidence in support of further additions of vitamin B₁ in the form of aneurin when national wheatmeal bread is used. In so far as they go, the data just cited support the findings of Gaunt, Irving, and Thomson (1938) that a poor human dietary of the type used in this experiment can be materially improved by supplementing with calcium in inorganic form.

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Medical Memoranda

Anaesthesia for Laryngofissure

In view of the growing popularity of surgical treatment of carcinoma of the larynx it is important that an adequate anaesthetic technique should be evolved. In the past preliminary tracheotomy, with its attendant risk of chest complications, has usually been performed. The suggested method does away with the necessity for a tracheotomy and ensures post-operative haemostasis. In a recent series of 8 cases performed by Mr. Charles Keogh there were no post-operative chest complications.

Method.—Premedication: omnopon 1/3 gr. and scopolamine 1/150 gr. 1 hour before operation. Induction: anaesthesia is induced in the normal way with N₂O, O₂, and trilene, using a Boyle apparatus. When the patient is well into the third stage of anaesthesia a stiff gum-elastic intratracheal catheter, St. Bart's pattern, size 12-14, is passed through the larynx into the trachea under direct vision. Great care is taken to avoid the growth during this manoeuvre. The proximal end of the catheter is now connected to the machine and anaesthesia is maintained with O₂ and trilene. Owing to the small bore of the tube it is usually necessary to supplement the volume of oxygen reaching the lungs by gentle intermittent pressure on the rebreathing bag with the expiratory valve fairly tightly screwed down.

Operation.—As soon as the incision has been made and the larynx opened the space between the catheter and the trachea is thoroughly packed off with narrow gauze, leaving one end emerging from the lower part of the wound. This ensures that no blood leaks down the trachea during the operation. The catheter is now found to lie in the posterior commissure of the larynx and usually interferes very little with the surgical procedure. If it proves to be in the way, then it may be retracted one way or the other. In only one case, where the growth was quite extensive, has this proved necessary. Anaesthesia is maintained as before with O₂ and trilene, aided by manual pressure on the rebreathing bag at each inspiration. Some of the gas percolates back through the packing in the trachea. As trilene is non-inflammable the diathermy may be used if necessary.

Haemostasis.—Following excision of the growth it is often very difficult to achieve perfect haemostasis. After removal of the tracheal packing and catheter the anaesthetist may play his part by passing a large-bore Magill tube, size 8-9, with inflatable cuff, through the nose and into the trachea under direct vision. When the cuff lies in the larynx it is inflated through the pilot tube until it occupies the lumen of the larynx and presses up against the field of operation. The laryngofissure is now sewn up, and the patient returns to the ward with a clear airway and a guarantee of haemostasis.

Post-operative Treatment.—The intratracheal tube is left in position for 8 hours. During this time the patient is given morphine, and a little 2% decaine solution is sprayed down the tube from time to time. In only one case did the tube have to be withdrawn earlier than was desirable. In this case it had been passed through the mouth. Provided it is passed through the nose very little discomfort is experienced. Eight hours after the operation the laryngeal cuff is deflated. After waiting a few minutes the patient is asked to

cough. If blood is coughed up through the tube, then the cuff is re-inflated and the same procedure repeated in 2 hours. If no blood appears, then the tube is gently but firmly withdrawn. Even this procedure causes remarkably little discomfort to the patient.

Conclusion.—The object of this technique is to provide safe anaesthesia for cases of laryngofissure without a tracheotomy and its accompanying disadvantages. Also it hinders the surgeon very little and assures him of post-operative haemostasis.

I am very grateful to Mr. Charles Keogh for his co-operation and valuable suggestions.

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A Combined Infection of the Throat with Diphtheria and Tuberculosis

I have failed to find in the literature any reference to such a combination, and am therefore of the opinion that the following case is worth recording.

The patient, a primipara about seven months pregnant, was admitted to Claypolds Isolation Hospital on Jan. 27, 1942, as suffering from diphtheria. The history given was that she developed a cold and cough on Dec. 27 and took to bed on Jan. 1. On Jan. 14 she had a sore throat, which she said was very swollen. On Jan. 26 vomiting began. Her doctor suspected diphtheria, and a throat swab taken that day was found positive for the diphtheria bacillus. On Jan. 27 she was given 16,000 units of diphtheria antitoxin intramuscularly before admission to hospital and a further 40,000 units intramuscularly after admission.

When admitted a greyish membrane was seen to cover the left side of the pharynx, left tonsil and pillars of the fauces, and the adjacent portion of the soft palate and uvula. The condition bore a resemblance to the smooth greyish-white appearance sometimes seen after a diphtheria membrane has separated, but did not appear to me to be quite typical. The left cervical glands were moderately enlarged and tender. The general condition of the patient was poor. Her face had a greyish cyanotic hue and the pulse was weak and rapid. The throat affection continued to spread, and it became evident in the course of a few days that the condition was one of extensive shallow ulceration with a thin ragged edge and a granulating base. The patient also had a distressing cough and brought up a few ounces of purulent sputum daily. Tuberculosis was suspected, and examination of the sputum on Feb. 3 showed that tubercle bacilli were present. Throat swabs taken on Jan. 30 and Feb. 8 still showed the presence of diphtheria bacilli. The Wassermann and Kahn reactions were negative. Physical signs in the chest were slight; but there was some impaired resonance, and air entry in the right scapular area. From Feb. 3 onwards the temperature was irregular, there being an average evening pyrexia of 100° F. The patient's appetite was poor, vomiting was frequent, and her general condition had deteriorated. On Feb. 14 she passed a few ounces of dark blood per rectum and also vomited some digested blood, becoming very collapsed. Though she revived somewhat, her condition on the following day was very poor, and on the morning of the 16th she began to complain of lower abdominal pain. At 2.30 p.m. the membranes ruptured, and at 3.30 p.m. she was delivered of a healthy premature male infant weighing 4 lb. 10 oz. Labour appeared comparatively easy, and was followed shortly by delivery of the placenta and membranes complete. There was no undue haemorrhage. At 5.15 p.m. the patient suddenly complained of inability to breathe. She became very collapsed and dyspnoeic, and died in about 10 minutes.

A post-mortem examination showed the presence of a thin-walled tuberculous cavity about 1½ in. in diameter at the right apex. There was acute tuberculous bronchopneumonia, with numerous small ragged cavities occupying the remainder of the right upper lobe. The tuberculous ulceration of the throat extended over the epiglottis, giving it an eroded appearance, and oedema and granulation of the vocal cords were present. The heart was dilated and the muscle pale and flabby; the liver was enlarged and pale from cloudy swelling. No other abnormality was discovered. The uterus was healthy and well contracted.

The condition of the baby was satisfactory. It gained weight rapidly, and was discharged from hospital in a thriving state. The Mantoux reaction was negative up to 1 in 100 dilution.

The extent and the rapid spread of tuberculous ulceration in the upper respiratory tract seen in this case were quite unusual, and it is interesting to speculate whether a diphtheritic infection acted in this instance as an aggravating or a predisposing cause. The natural resistance to tuberculosis was obviously so poor that recovery was not to be expected. It was not anticipated, however, that the patient would die so suddenly. The strain of labour on a heart affected with diphtheritic carditis would help to explain the sudden death. As I had not had the opportunity of seeing this case in the earlier stages of the throat infection I cannot altogether exclude the possibility of the diphtheria bacillus existing merely as a saprophyte in a tuberculous throat, but nevertheless consider that the case is of unusual interest.

My thanks are due to Dr. Thomas Orr, medical officer of health for Ealing, for his kind permission to publish this case.

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