

SOUTH AFRICAN PRODUCE AT THE LONDON DAIRY SHOW, 1921.

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AT the London Dairy Show, held in the Agricultural Hall, Islington, from the 18th to 22nd October, 1921, the large number of entries from South Africa in the classes for colonial dairy produce was a notable feature. Although failing to win the gold and silver medals for colonial cheddar cheese, as was the case at the 1919 and 1920 shows, Union exhibitors achieved considerable successes and deserve commendation for both the quality and general "get up" of the exhibits staged. The exhibits, together with the Government exhibition of dairy produce, certainly enhanced the reputation South Africa is building up for her dairy products on the London market.

Being on leave in London at the time, I was instructed to attend the show and obtain all possible information regarding any criticisms made in respect of our produce, and to interview the trade and others interested in the purchase of South African dairy produce. I was able to discuss the merits and faults of our produce with a number of eminent experts and merchants, and collected a good deal of valuable information which I now propose to pass on for the benefit of those interested.

I will first deal with the competitive classes in which Union exhibitors competed.

Colonial Cheddar Cheese.—This class was for four cheeses (coloured or uncoloured) not less than 60 lb. each. There were nineteen entries, viz., twelve from South Africa, six from Canada, and one from New South Wales. At the two previous shows Australasian factories were strongly represented but on this occasion they only had one entry. Competition, I was informed by the judge, was very keen, and he made the following awards:—

Gold medal: Mountain View Cheese Factory, Rossmore, Ontario. Silver medal: A. A. Ayer & Co., Montreal, Canada. Bronze medal: Dominion Cheese Co., Atwood, Ontario. Reserve: J. T. Moxham, Riverton, Cedarville, East Griqualand, South Africa. Highly commended: G. W. Young, jun., The Meadows, Franklin, East Griqualand, South Africa; Rocky Ridge Cheese Factory Co-operation, Ltd. (Kruis Spruit Factory), Kokstad, East Griqualand, South Africa. Commended: G. W. Young, Wanstead, East Griqualand, South Africa; Benson Avery, Rinburn Cheese and Butter Association, Rinburn, Ontario, Canada.

It will be noted that the first three prizes were secured by Canadian factories, South African factories being placed fifth, sixth, seventh, and eighth. Unfortunately, the Judge, Mr. H. J. Grimsdell, did not score the cheese, consequently

no score cards indicating where our exhibits had failed were available. After he had finished judging, however, he very kindly furnished me with the desired information, and also went through the cheese with me. He stated that in his opinion the winning Canadian cheese possessed a more pronounced and fuller flavour than that from the South African factories, which secured mention, and it was only on this account that the latter was beaten. The quality, texture, and body of the best South African exhibits, he remarked, were excellent and equal to that of the winning exhibits. The colour of some of our exhibits was inclined to be dull and did not possess that bloom and brightness which is so desirable, and this naturally told against their success. One exhibit was also too deeply coloured even for a coloured cheese. The salting was considered correct, and the general appearance and "get up" was quite satisfactory with one or two exceptions.

Colonial Salted Butter.—This class was for one box containing not less than 56 lb. There were 53 entries, viz., 24 from New South Wales, 10 from Queensland, 8 from South Africa, 5 from Canada, 3 from South Australia, 2 from New Zealand, and 1 from Victoria. The first three awards all went to New South Wales factories with scores of 99, 98, and 97½ points out of a possible 100. No other tickets were given, in spite of the fact that six other exhibits obtained 96 points and ten 95 points, which one would have thought entitled them to highly commended and commended tickets respectively, particularly in such a large class. Among the exhibits scoring 95 points were two from South Africa. These are the best scores so far obtained by South African butter on the London Dairy Show, and are very creditable, especially in view of the fact that the butter for this show has to be manufactured at the worst time of the year for South African creameries.

Other South African exhibits scored 94, 93, 92, and 90 points. Altogether, I consider our creameries did well in this class, and trust that their comparative success will act as a stimulus to increased effort resulting in even better results at the next show.

The following are the detailed scores of the prize-winning butters compared with the best South African exhibits.

SALTED CLASS.

	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.	Prizes.
Maximum Points ...	55	20	10	10	5	100	
Manning River Co-operative Dairy Co., Ltd., New South Wales	54	20	10	10	5	99	1st
Mackay River Co-operative Dairy Co. Ltd., New South Wales	54	20	10	10	4	98	2nd
Binna Burra Co-operative Dairy Co., Ltd., New South Wales	52½	20	10	10	5	97½	3rd
Aliwal North and District Creameries, Ltd., Indwe South Africa	53	20	10	8	4	95	—
Natal Creamery Co., Ltd., Pietermaritzburg, South Africa	52	20	10	8	5	95	—
Aliwal North and District Creameries, Ltd., Aliwal North	50	20	10	10	4	94	—

UNSALTED CLASS.

	Flavour.	Texture.	Colour.	Packing.	Total.	Prizes.
Maximum Points ...	60	25	10	5	100	
Maryborough Co-operative Dairy Co., Ltd., Queensland ...	58	25	10	5	98	1st
Singleton Central Co-operative Dairy Co., Ltd., New South Wales	57	25	10	5	97	2nd
Manning River Co-operative Dairy Co., Ltd., New South Wales	56	25	10	5	96	3rd
Nels Rust Dairies, Nels Rust, Natal, South Africa ...	55	20	8	4	87	—

Colonial Unsalted Butter.—This class was also for one box containing not less than 56 lb. There were 45 entries, most of the factories competing in the salted class also entering in this, but only four South African creameries competed. The first prize went to Queensland, and the second and third to New South Wales, the respective scores being 98, 97, and 96 points. South African factories did not do so well in this class, our butter apparently failing successfully to stand the severe test without salt. Although not wishing to criticize the judging I must say that I found it difficult to understand the low scores given to our exhibits in this class; I examined the butters, and, in my opinion, the scoring was exceptionally severe. Even so, there is no doubt that our unsalted butter had not kept well and manufacturers must give more attention to the selection of only the finest grade of cream for such butter. I understood that all the Australian butter exhibited was manufactured from pasteurized cream, and the result is certainly an object-lesson to us.

Colonial Bacon.—This class was for four sides of bacon. There were nine entries, all from South Africa except one from New South Wales. The Farmers' Co-operative Bacon Factory, Ltd., Estcourt, Natal, secured the gold medal, scoring 92 points; this company therefore repeated their success of the previous two years. Messrs. Sparks and Young, Durban, were placed second and awarded the silver medal, their exhibit scoring 90 points, and the Estcourt Factory were third with another exhibit scoring 87 points.

I was given to understand that the quality of our exhibits was hardly up to the high standard of last year, when the Estcourt factory's winning exhibit scored 100 points, but that this was to some extent at least, due to faulty smoking of the bacon in London.

Colonial Eggs.—This class was for one cubicle box containing 360 new laid eggs, as imported. Average weight of 15 to 16 lb. per 120 eggs. There were seven entries, all from South Africa, and the following awards were made:—

1st: Cape Egg Circle, Ltd., Claremont, C.P.

2nd: Cape Egg Circle, Ltd., Claremont, C.P.

Reserve: N. Harrison, Capetown.

Very highly commended: Cape Egg Circle, Ltd., Claremont, C.P.

I was informed that the eggs opened up in excellent condition and were equal to any received in Britain from other oversea countries. Merchants appeared to take great interest in these exhibits, and stated there was an unlimited market for such eggs, provided uniformity in size was maintained, and they opened up true to grade.

Colonial Dead Poultry.—This class was for: Collection of Colonial dead poultry; total weight, including packing, not to exceed 10 cwt. There was only one exhibit, namely, from the Imperial Cold Storage and Supply Company, Ltd., Durban, which was considered of sufficient merit to justify the award of the first prize, a silver medal. The exhibit comprised fowls, ducks, and turkeys, all of which opened up in excellent condition, and were very favourably commented upon by both the trade and general public. If regular consignments can be sent over to arrive in such condition, there is a good market in London for dead poultry of the quality exhibited.

GOVERNMENT EXHIBITION.

The South African Government Pavilion presented an imposing and attractive appearance. The produce displayed consisted entirely of butter, cheese, bacon, hams, eggs, and dead poultry, a splendid collection of produce sent by Union producers and merchants.

The pavilion was of considerable size, the walls being decorated with typical South African farm scenes. These formed a background for the exhibits of produce, which were most effectively displayed. Each exhibitor's produce was kept together, and a card with the name of the manufacturer and the agent handling it in London was attached.

The whole formed an impressive and practical illustration of what South Africa is now in a position to supply in dairy produce of the type and quality required by the British market. It was a magnificent advertisement for our dairy producers and South Africa as a whole. Large numbers of provision merchants from all over the British Isles visited it, and were profoundly impressed with the exhibition, particularly with the quality of our cheese and eggs; they were furnished with all information as to supplies and the prospects of our export trade during the coming season, and evidence was forthcoming that fresh business connections and outlets for our produce were opened up in the provinces.

The fact that all our produce was Government graded appealed greatly to buyers; copies of the regulations were available and were distributed to those interested, who appeared to be unanimously of opinion that if regular supplies of uniform quality were forthcoming and the grading regulations were strictly carried out, South African dairy produce should soon establish a high reputation on the British market.

The Trade Commissioner and his assistants were indefatigable in connection with the erection of the pavilion and display of the exhibits, and the successful results obtained were in large measure due to their efforts. The award to South Africa of a gold medal by the British Dairy Farmers' Association for the finest display in the show of colonial dairy produce was a fitting and well deserved reward.

The Trade Commissioner greatly appreciated the support manufacturers and merchants afforded him in sending such a fine collection

of produce, and desires the valuable results achieved to be widely known; in order, however, that full advantage may be taken of same, it is necessary that regular shipments of produce up to the standard of that displayed at the exhibition be made. It is also necessary that an equally fine collection of produce be sent over again for this year's show, in order that the good impression already created may be maintained. It will be greatly to the advantage of producers here to see that such is provided.

The value of the exhibition, however, did not end with the actual display. Although, as already indicated the products were generally praised and the opinion expressed was that there had undoubtedly been a great improvement in both the quality and "get up" as compared with a few years ago, it was only to be expected that certain criticisms should also be made. In order that such criticism should be both reliable and useful, during the course of the show, I got such eminent experts as Mr. John Benson, who may be described as one of the fathers of present day British dairying; Mr. J. F. Blackshaw, Chief of the Dairying Section at the Board of Agriculture; Mr. Alec Todd, Principal of the British Dairy Institute, Reading; and Mr. Sutherland Thomson, Technical Adviser and Consultant in Dairying, London, and late Dairy Adviser to the Governments of South Australia and Queensland; to examine our exhibits of butter and cheese on the Government stand. The general part of a technical report on the exhibits, furnished also by Mr. Sutherland Thomson, is appended to this article, and contains some very useful suggestions.

The criticisms and faults (and their correction) pointed out by the above-mentioned gentlemen are given in the summary below, and include such faults as were pointed out to me during the course of several inspections of shipments of South African butter and cheese, which arrived in London during my stay there, together with my own and such ideas as I was able to gather from the authorities I came in contact with.

BUTTER.

(a) *Packing and General Appearance.*

The importance of this was impressed upon me on every hand. An attractive and neat appearance has a considerable influence on the sale and price realized. Buyers often even refuse to examine sample cases from consignments, the general appearance of which does not appeal to them, although there may be nothing whatever wrong with the quality of the butter.

The packing and get-up of the exhibits on the Government stand were very good, and all were awarded maximum points under this heading, with one exception, and this lost one point on account of the boxes being considered too light and not sufficiently substantial for export purposes. If all our butter shipped to London were as well packed and as attractive in appearance (there is no reason whatever why this should not be the case), I am sure there would be no complaints on this score. Unfortunately, some of the shipments I examined were not as good in this respect as they might have been; particularly was this the case in respect of second and third grade butters, the packing and "get-up" of which appeared to have been neglected. I cannot too strongly impress upon creamery managers that an attractive appearance is just as necessary in the case of these butters as with

first grade. If a butter is third grade there is obviously all the more need to make it look nice and attractive.

The following are the principal points to attend to in packing butter for export:—

(1) *Boxes*.—Only *new* boxes of sufficient strength to stand the voyage and rough handling incidental to shipping should be used.

(2) *Paper*.—Only the best vegetable parchment should be used for lining the boxes, and care should be taken to see that the corners of the box are lined. An extra piece of parchment paper should be neatly folded to the size of the box and placed on top of the butter. The ends of the lining paper should be neatly folded down on the top in the form of an envelope flap. The use of cheap, inferior quality butter paper is false economy, as such paper when it becomes wet, as it must do, sticks to the butter and breaks into rags, thus presenting a very unattractive appearance. A doubled sheet of parchment paper is advocated for lining boxes for export butter, but on no account should brown paper or other than parchment paper be used even for the outer lining.

(3) *Packing*.—The butter should be well stamped into the box, the corners receiving particular attention and no holes or crevices between the lumps of butter should be allowed to remain. The top of the butter, which will be revealed to the buyer when the case is opened up, should be neatly finished off. The well-known honey-comb pattern pressed on with a roller, by which the initials of the company or name of the brand are also pressed across the middle, is most satisfactory, as it not only gives an attractive appearance, but also tends to show up the colour.

(4) *Weight*.—The weight of the butter packed should also be carefully checked; it is advisable to pack at least $56\frac{3}{4}$ lb. at the creamery, as only boxes containing $56\frac{1}{2}$ lb. will be passed by the grader at the coast, and this allows for shrinkage. The boxes must contain 56 lb. full weight on arrival in London, but as it is obviously impossible for the grader to weigh every box, the creamery manager should make sure that each box exported contains correct weight in order to safeguard the reputation of his creamery and brand in London. Buyers soon fight shy of a brand found to be short weight.

(5) *Marking*.—Every case should have all marks neatly stencilled on them; marking by means of crayon, as I have occasionally seen, is unsightly and often illegible. All marks referring to the same particulars should be placed on the same place on each box; for instance the churn markings should be placed on the top left hand corner of one side of the box and the registered number of the creamery, enclosed in a circle, on the opposite top corner of the same side; this latter should be in figures large enough to be read at some little distance away. The brand of the butter or/and name of the creamery manufacturing same, should also be stencilled on the box, unless preferably this has been already machine pressed on to same.

(6) *General*.—The nailing up of the boxes should be carefully performed, and care be taken that nails do not miss the wood and pass through the lining paper into the butter, as this is sure to result in rusty mould marks which present an ugly appearance when the case is opened up.

Attention to all these details is highly necessary, and lack of same is certainly not without effect on the prices realized for butter in London.

I am convinced that most if not all creamery managers are fully aware of what is necessary, but I fear details of packing are not infrequently left to natives, without adequate supervision. Not a single case of butter intended for export should be allowed to leave a creamery before it has been inspected by the manager or his assistant. I would, however, like to mention that our graders report a great improvement in the packing and appearance of recent consignments presented for export, which, I trust, will be maintained, and that we shall receive no further adverse criticisms in this connection.

(b) *Colour.*

With one or two exceptions the exhibits on the Government stand were very good in this respect, and nearly all were awarded maximum points. I, however, heard a good deal of criticism in regard to the uneven and mottled colour of some of our butter shipped commercially, again particularly in respect of second and third grades.

The chief fault was what is known as "mottle" or in an aggravated form as "streakiness." This must not be confused with "spots" or "specks," which are due to thin cream in which the richest part has, during the process of ripening (owing to regular stirring having been neglected), risen to the top part of the cream can, leaving the milky part at the bottom; the latter when it becomes sour coagulates, and on arrival at the creamery is very sour, as is usually the case, will, when stirred, form into hard flaky pieces of curd which, unless carefully strained out before mixing with the other cream, will show as white specks in the manufactured butter, as it is impossible to get rid of all during the washing process. Such cream should of course be graded down and the suppliers informed of the reason.

"Mottle" or "streakiness" is, however, due to carelessness during the manufacture of the butter. Probably the commonest cause is insufficient washing while the butter is in the granular condition, or overchurning before the break water is added.

In the former case if the washing is discontinued while the wash water is still cloudy a certain amount of casein is conveyed into the butter and clings around the grains; the addition of salt to the butter has the effect of hardening this casein, which forms a tough film round the grains and prevents the salty water or brine from penetrating them. One of the effects salt has on butter is to deepen the colour, consequently the butter, which comes in contact with the salt, assumes a deeper colour than the inside of the butter grains which do not so come in contact, and are not salted at all, or only lightly salted. The result is "mottles," which, however, are not apparent immediately in freshly salted butter, but only show up after a few hours, as a rule.

In the case of butter overchurned before the break water is added, an uneven grain is almost certain to result, due to the fact that creams at various stages of ripeness and of varying degrees of thickness, have been mixed together, and where such cream is churned it will "break" irregularly, but the addition of water at the first signs of the cream breaking, as shown by a slight clearing on the glass, will reduce

the cream to a common degree of acidity and thickness, and the butter will "come" simultaneously and an even size grain be obtained. After the addition of the "break" water, which should be at a temperature of not more than two degrees lower than that at which the cream was churned, churning should be continued until the grains of butter are about the size of clover seed; then the butter-milk should be run off. The first wash water should then be added at about the same temperature as the "break" water, and the churn revolved five or six times, then drained away. The second wash water should then be run in. This may be at a temperature of two degrees lower than the first if thought desirable. With this washing the churn should be revolved until the grains are about the size of rice, when it is drained away. Usually two washings will be found to be sufficient, but if the second wash water still comes away cloudy, indicating that it contains buttermilk, then, and then only, a further washing should be resorted to, but with this washing the churn should only be revolved two or three times, and care must be taken not to increase the size of the grains of butter. An even-sized grain is most important, as when some of the grains are much larger than others, the former are bound to enclose butter-milk, which no amount of washing will get rid of, with the result that certain portions of the butter will be more affected by the salt than others, and "mottle" will appear in the finished article. Strict attention to temperatures is also essential; at times butter-makers may be tempted to churn at too high a temperature with the idea of correcting the temperature at time of washing by the use of very cold water, and thus saving time. This is a very undesirable practice, and is almost certain not only to have a bad effect on the texture and body of the butter, but will also cause mottles. The cream should invariably be got to the correct churning temperature before it is run into the churn and, although, as suggested by Mr. Sutherland Thomson in his report, I believe low temperatures are necessary with South African creams, particularly with those produced in Natal, the reduction of temperatures should be gradual, a difference of not more than two degrees being made between the churning temperature and "break" water, break water and wash water, and between each wash water.

Another common cause of "mottles" or probably its more aggravated form known as "streakiness," is mistakes in the salting of the butter. If the butter is slightly worked before the salt is added or if part only of the salt it is intended to use is added before working, and the butter is then partially worked before the remainder is added, "streakiness" is sure to result, unless the butter is held over in the air lock for several hours and then again worked. The proper way is to add all the salt before the grains of butter have been pressed together by working, or it will not be possible for the salt to become evenly distributed and properly incorporated in the butter with one working. In the event of an error of judgment having been made in the quantity of salt required by any churning, only being discovered when the working is partially completed, it thus being essential to add more salt, this must of course be done, but in such cases the butter should be placed in the air lock over night and re-worked next morning. In such cases, however, it must be remembered that a second working will have an effect of reducing the moisture content of the butter 2 to 3 per cent., consequently the original working must not be too complete or the

finished butter will be found to contain less moisture than is desirable. Further, when a second working is resorted to it should be carried out in the early morning, when the temperature of the butter room is cool, and great care must be exercised that the butter does not become greasy. I am also of opinion that another cause of "mottle" is packing butter straight out of the churn and immediately placing the cases in a cold store several degrees below freezing point; it is always advisable to place the cases in the air lock for a few hours before putting them in a very cold store.

I have dealt with this fault rather fully because it is one commonly found in our butters, not only in those exported, but also in those sold in South Africa, and it is entirely within the power of our butter-makers to prevent it. I feel sure that attention to the points I have mentioned will have the desired effect. While in London I was afforded an opportunity of examining a considerable quantity of New Zealand and Australian butter, and in not a single case of either first, second, or third grade did I notice "mottle" or "streakiness," although I understood the fault was not uncommon in their butters some years ago. What they have done in this respect there is no reason why we should not also accomplish.

(c) *Salting.*

Generally, our butters appear to be correctly salted for the London market. Mr. Sutherland Thomson found fault with only one exhibit he examined in this respect, and it was obviously over-salted. It may have been noted that some of our exhibits in the competition classes lost points on this score, but the judge made no remarks to indicate the reason, and I was unable to ascertain same. Merchants I spoke to on the matter appeared to have no complaints to make on this account.

Texture and Body.—I do not think there is a great deal to complain of in our butters in respect of these points. An Inspector from the Ministry of Food I met, who was responsible for the examination of butter received under the Imperial Government's contracts, informed me that the texture and body of South African butter was generally very favourably commented upon, and for that reason it had become popular with merchants for blending purposes. On reference to Mr. Sutherland Thomson's report it will be noted that he complains of what he describes as a fatty texture, although he states this has diminished compared with earlier shipments. He suggests investigation into the causes of this, and indicates the lines on which a remedy may be found. I would commend his remarks to creameries, and particularly to those operating in Natal, as the butter from that province appears to be mostly affected.

Flavour.—This is, of course, the most important characteristic of butter, and at the same time the one over which the butter-maker has the least control. Under the conditions we are perforce compelled to manufacture butter in South Africa, the flavour of the butter must inevitably depend to a large extent on the conditions and flavour of the cream received at the factory, at any rate in the absence of pasteurization of the cream. Of course, careful grading of the cream will materially assist in standardizing the flavour and enabling a sound first grade butter to be produced, but at times undesirable flavours are not evident in the cream

and only show their presence later in the butter. This is particularly the case in respect of sweet cream, which is delivered to the factory within 24 hours of separating, and I would warn men performing cream-grading at creameries to give increased attention to such cream. Butter-makers at times are at a loss to understand how it is that in spite of the most careful grading particular churnings of butter develop undesirable flavours, and are degraded by the graders at the coast; more often than not it is due to a can or cans of what appeared to be perfectly sound sweet cream having been infected with undesirable bacteria, which had not had time to develop in the cream, but which later on have multiplied and, obtaining the upper hand in the butter, have set up the bad flavour. This class of cream should be carefully watched, and it is a good plan, from time to time, to keep samples from such cans of cream a couple of days to note what development takes place. In the event of undesirable fermentation taking place cream from that particular supplier should be held "suspect," and the grader would be justified in degrading it in spite of the fresh cream having no apparent fault, until such time as he, the grader, is satisfied the supplier's cream will no longer cause trouble. The supplier should, of course, be informed of the reason why his cream is graded down and be advised how to overcome the fault. It is in this connection that farmers supplying cream to creameries can be of enormous assistance by giving the most careful attention to cleanliness in respect of all milking operations, and ensuring that their cream is produced under the best possible conditions and receives every care and attention in treatment, prior to its dispatch to the creamery. The scope of this article does not permit me to go into detail, but every creamery sends out circulars containing full information and instructions, which should be carefully followed, while pamphlets on the subject can also be obtained from the Division of Dairying, Pretoria. By so doing farmers will greatly assist creameries in improving the flavour of our butter, which will result in increased prices on the London market, and benefit will accrue to suppliers in that creameries will be enabled to pay higher prices for first grade butter-fat.

In short the majority of the various undesirable flavours which manifest themselves in butter are traceable to improper or careless treatment of the cream by the supplier.

CRITICISMS OF BUTTER.

To return to the criticisms of our butter in London, I found that in so far as our first grade butters were concerned the flavour was considered fairly satisfactory, but hardly sufficiently pronounced, while in some cases complaint was made that after distribution out of cold storage the butter did not keep well. The latter is by far the more serious complaint. I am inclined to think that this in some cases may have been due to insufficient washing of the butter as indicated by the tendency to "mottle" so often noticed in our butter. In such cases it can and must be remedied by greater care in this respect. Another cause is doubtless the presence of undesirable bacteria imported into the butter by means of the cream, which, although kept in check while the butter is in cold storage, quickly increase when the butter is exposed to normal temperatures and cause it to deteriorate or go "off" in flavour, as it is described. Most, if not all, of the butter I inspected,

however, had been stored several months before being shipped, and it was perhaps hardly to be expected that such butter would keep well out of cold storage, manufactured as it was from unpasteurized cream. It will be interesting to receive reports on the shipments of new season's butter which have recently been exported.

Pasteurization of the cream at the factory and the ripening of same with an active, pure culture starter would undoubtedly enormously enhance the keeping qualities of our butter, and would also help to bring about a more pronounced choice "butter flavour" in our butters. I was very greatly impressed by the New Zealand and Australian butters I saw in London, which had been made from pasteurized cream, particularly with their wonderful keeping properties. I examined a case of New Zealand butter manufactured in 1914, which was still quite sound in flavour and apparently as good as the day it was made. I am convinced that our creameries will have generally to adopt pasteurization if we are successfully to compete on the London market with butter received from the above-mentioned Dominions; if it has been found necessary in their case it is even more so in ours with our warmer climate and great distances which cream often has to travel to the factory. One creamery which has gone in for pasteurization in this country sent to the London dairy show several cases of butter made from pasteurized cream and several made from unpasteurized cream; the former was handicapped by being unsalted, whereas the latter was salted. These butters were examined by Mr. Sutherland Thomson, and he scored the pasteurized butter 94 points and the unpasteurized 87, a striking example of the value of pasteurization. He also remarked that the pasteurized butter was a sound commercial butter, well suited to the British market, and that it showed some of the fine characteristics of New Zealand butter. The unpasteurized butter lost four points for flavour and three points for texture compared with the pasteurized, and the flavour of the former was described as being "off."

I am, however, not in favour of every creamery in the country immediately going in for pasteurization. Many of our creameries are not adapted for the installation of the plant, nor have they the necessary refrigeration and steam power available, while not all of our factory managers have a sufficient knowledge of the process to ensure successful results.

It is also by no means certain whether the "flash" or "holding" systems of pasteurization will be most suitable for our conditions, and there are many other points which require elucidation. What I would suggest, however, is that some of our larger creameries or creamery groups undertake comprehensive experiments on a commercial scale, and that arrangements be made for examination and report on the butter on arrival in London on the lines suggested by Mr. Thomson.

Now that we appear to have definitely reached the stage of regularly exporting butter and cheese, the necessity for research and investigation as well as experimental work, not only in respect of pasteurization, but in many other directions in connection with the industry, is increasingly apparent, and it is hoped that facilities for the carrying out of same will be afforded.

Another common fault observed in our butter was what is described by the trade as "toppiness," which is the development of an

objectionable bitter flavour on the outside surface of the butter; it does not, however, penetrate deeper than about half-an-inch, but when the affected part is removed the new surface exposed very quickly develops the taint. As already mentioned, the butters I examined had been stored some time, and probably this fact was responsible for the taint, although it was suggested that it might be caused by the use of inferior salt containing impurities, which, on exposure to the atmosphere, oxidised and gave the butter the bitter taint. This fault was naturally most in evidence with butter packed in pats.

I might here mention that apart from the fact that pats do not keep as well as butter packed in bulk, the London market does not require them; pats will invariably realize a lower price than bulk butter of similar quality. I would recommend creameries who find themselves with a surplus of pats which they desire to export, to consider the expediency of converting same into bulk before exporting, as I feel sure it would pay them to do so.

Turning now to the flavour of our second and third grade butters, I found the principal faults were "fishiness" and staleness. "Fishiness" is a most objectionable flavour which butter at times acquires, and has given trouble in all butter-producing countries. The direct cause does not appear to be definitely known, but the consensus of opinion is that it is due to an organism which, acting on the fatty acids of the butter, produces a chemical with a strong flavour and smell of fish oil. The source of infection is generally thought to be uncleanness and dirty handling of the milk or cream, or through the use of old rusty cans which cannot be kept properly clean, or it may even be through unclean conditions in the creamery or cold store. Storing at very low temperatures tends to check development of "fishiness," but the most effective preventive is pasteurization of the cream.

The staleness was perhaps not more pronounced than was to be expected of stored butter of these grades.

There is also the need for packing only butter of the same character and particular colour under one brand. Buyers in London attach a great deal of importance to uniformity and, when they buy a parcel of a particular brand, object to getting butter of varying degrees of colour. There is a market in Britain for all degrees of colour, some parts of the country prefer a pale butter and others a deeper colour, and if a buyer purchases, say 100 cases of pale coloured butter for a district requiring same, and his client on opening it up finds a number of cases containing deep coloured butter, he naturally complains, and the merchant avoids buying that brand in future as he cannot rely on it being uniform.

I would strongly advise companies having creameries in different parts of the country, where the colour of the butter manufactured is not the same, to pack the butter from each creamery under a different brand; this applies, of course, to all grades.

I must, before concluding my remarks on butter, refer to the excellent exhibit of butter sent by the Bloemfontein District Creamery for exhibition on the Government stand. This exhibit was scored by Mr. Sutherland Thomson 97 points, who remarked, "This butter is of outstanding merit and might readily pass for a high-grade New Zealand product. It is a standard of quality to be copied as far as possible throughout the Union."

It would appear that pasteurization is hardly necessary in the case of this creamery, at any rate in respect of first grade cream. Unfortunately this exhibit was not entered for competition, but it is hoped that the creamery will enter at the next show.

CHEESE.

I had no opportunity of examining any shipments of cheese as none arrived during my stay in London. The following remarks therefore refer only to the cheese sent for exhibition on the Government stand at the show. Mr. Sutherland Thomson examined all the exhibits and his report is appended. I have not much to add to his remarks. Generally our cheese exhibits were highly praised, the principal criticism being directed against the size of the cheese. The London market prefers a cheese weighing from 80 lb. to 90 lb., and on no account should cheese be sent weighing less than 60 lb. Merchants state that our 40 lb. to 50 lb. cheeses are too small for the wholesale trader and too large for the individual householder. Factories are recommended to go in for larger moulds with a diameter of $14\frac{1}{2}$ in., which will enable a good shaped 80 lb. cheese to be turned out for export; this will result in higher prices being obtained.

The colour of several of our exhibits was criticized on account of dullness; this it was suggested might be due to the annatto used not being of good quality.

An uncoloured cheese is preferred on the London market and except during winter time when, without the addition of a little colour, the cheese would be absolutely paper white, factories are recommended not to use colouring when making cheese for export. Generally, uncoloured cheese realizes a better price than coloured, but occasionally when there is a shortage of the latter the position is reversed. If a coloured cheese is made, about 1 drachm to 8 to 10 gallons of milk is correct, varying a little according to the time of the year, pasture, etc. With regard to flavour Mr. Sutherland Thomson deals with the tendency to weakness, and suggests how this may be improved. I hope some of our cheese factories will experiment in the direction he advocates.

In some of the exhibits the flavour showed a tendency to become slightly bitter; this is often caused by too rapid cooling of the curd before going to press.

The Tweespruit Dairies' exhibit was considered to be the best of our exhibits, and most suitable for the London market, and was awarded 97 points. It is to be regretted that this company did not enter their cheese for competition, but, no doubt, they will do this at the next show.

In conclusion I am satisfied that if attention is given to the various faults dealt with in this article, and the particular requirements of the London market are studied, there is every prospect for dairy produce gaining a reputation on the London market. This will be much assisted by the regular shipment of consignments of freshly-made butter in place of the spasmodic shipments of stored butter which have severely handicapped our produce in the past.

REPORT ON SOUTH AFRICAN BUTTER AND CHEESE.

By G. SUTHERLAND THOMSON, F.R.S.Ed., N.D.D., B.D.F.D.

Butter.—It is three years since I made an official examination of exhibition butter for South Africa, and two years since I judged the colonial cheese class at the Royal Agricultural Hall. The qualities of the produce remain familiar to me, and this has proved useful in making a comparison with the butter and cheese dealt with in this report.

Taking the butter first, I am pleased to say that an improvement is very obvious. There is a healthy tendency to crispness in the salted classes, also a more defined flavour of choice butter, and the fatty texture which was so pronounced before in both salted and unsalted butters has diminished. The two outstanding weaknesses, however, are the same—an insipid flavour and a fatty texture. Upon these, South Africa should continue to concentrate attention. To universally develop a more pronounced “butter flavour.” I would recommend a specially active culture for ripening and controlling the cream, which can now be obtained from Denmark. Supplies of the culture would require to reach South Africa monthly to guarantee purity of starter, and a free development of the choicely flavoured acid, etc. Might I be permitted to suggest that factory experiments on a comprehensive scale be entered into, and the butter in all cases judged on points *immediately* before shipment and again on arrival in London.

In making this suggestion I have taken into consideration the fact that South African butter has its own characteristic properties. Weakness of flavour, to my mind, is indigenous to parts of the Union. The same applies to texture, and the “fattiness” complained of in this report may be more common in Natal, which means that the Natal climate and the natural food for dairy stock favour a high percentage of soft fats. Low temperatures in the treatment of cream, also in churning, storage, etc., appear more imperative in South Africa than Australia, although generally speaking South African cream is not likely to develop acidity and rancidity so rapidly. With low temperatures and a natural slow acidity, the need for a robust ripening culture becomes the more obvious.

Cheese.—I have also been impressed with the quality of your cheese exhibits. It is a pity that some of the show stand lots had not been entered by the makers in the colonial competitive section of the dairy show. A review of the points awarded illustrates the victory that such fine quality cheese was entitled to in a competitive class.

In the butter section, I have specially drawn attention to the outstanding weakness in flavour, and the same weakness is noted in the cheese, although to a lesser extent. In the case of texture there is a distinct sympathy with that of butter, which is of considerable importance to the industrial investigator, and it would be useful to know if lime compounds are of low percentage in South African dairy soils. It is my belief that such is the case. Colour of the cheese will be seen to be reduced in points owing to dullness, and I would suggest that the general quality of the annatto used be inquired into. I must again point out that these weaknesses of flavour and texture are not to be

attributed to the factory. They are more or less indigenous, and this should be seriously considered in the working of the industry. A comparison of your butter with Danish and New Zealand produce will perhaps prove my point, and a comparison of your cheese with English, Scottish, and New Zealand cheddar, also will be useful. As in cream ripening you require an *active* starter for the cheese milk, and it would be valuable to experiment with pasteurized cheese, using 75 per cent. of milk heated to 145° F., to which is added (when milk is sufficiently cooled) 25 per cent. of selected whole milk.

I have no hesitation in saying that your butter and cheese exhibits reflect credit on state education and factory work, and to my mind the future of your export trade is thoroughly assured.



Students Making Butter, Elsenburg School of Agriculture.

The Stock of Turkish Mohair.

In a report on the position of the Turkish mohair trade published in the *Monthly Trade Journal* for December, 1921, of the British Chamber of Commerce of Turkey and the Balkans, it is stated that "the mohair trade in Constantinople looks like being down for a long holiday" unless a demand for fair and ordinary average hair soon sets in, the finest sorts and low qualities having been sold out. Commenting on the available stocks of Turkish mohair, the *Journal* states "it is clear that there is little good stuff . . ., in the event of even a small demand setting in, and there still seems to be no immediate prospect of any important quantity coming forward from the producing districts."