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that are not taken away from the pasture and have not died from bloat.

DR. FILMER: That is a possible explanation. The cows may eat faster when they go back to the pasture than they normally do. Some of the American work does suggest that bloat is related to the rapidity with which the stock eat the pasture. They have taken pasture that produces bloat and pasture that does not and have inoculated both with the organisms from the rumen and find that the amount of gas generated is no greater from the bloat-producing pasture than from the other. This suggests that the amount of gas produced in the rumen is closely related to the speed with which pasture is eaten. Observations such as Mr. Candy's are extremely valuable.

MR. LONG: I would like to support Mr. Candy's remarks. Another good remedy is where possible to keep cows well fed on night paddocks. As regards feeding more hay in the spring to prevent mastitis, I agree that the difficulty is to get cows to eat it. I do not feed hay in the spring flush but feed plenty of it in the winter and then they have the resistance.

MR. GERRING: Regarding Mr. Candy's remarks about the time spent in the shed. It is a factor worth considering but you do see bloat among cattle which are never brought into the shed and do not even get a change of pasture. It is not common but it does happen.

MR. CAMPBELL: In Canterbury we only had cases of bloat in the spring and invariably it was associated with the north-west wind conditions.

DR. ANNETT: I think the N.Z. No. 1 white clover adds to grazing hazards. Its growth is so vigorous that it may become dominant in the pasture.

DR. HAMILTON: Can Dr. McMeekan give any figures on his high and low plane cows about low winter feeding in relation to mastitis?

DR. MCMEEKAN: We have no information for or against. We have imposed very severe differences in winter nutrition between groups of cows for two successive years but there has not been any difference in mastitis subsequently. I would like to point out that it provides a very good illustration of Dr. Filmer's main point - the complexity of many of these grazing hazards. Of all of them bloat seems one of the most complex. I have had some experience with bloat but nothing seems to work all the time. One of our firm beliefs at Massey about ten years ago was that cattle that were not subjected to the temptation of sudden big fills of new pasture were not subject to bloat. We had a line of ten breeding cows that were left in the one paddock and frequently during the season, when up to 60 per cent of the herd would be blown, we would point to these cows as examples of animals that did not get blown. Unfortunately, we walked out one day to find three of them dead from bloat. In the Argentine I saw literally millions of animals grazing permanently on alfalfa which in this country under comparable conditions would be a highly hazardous undertaking. There it appeared to be quite safe except now and then when for some quite unaccountable reason heavy losses would occur. I think it is a problem that emphasises the complexity of many of these animal-pasture interactions.

SHEEP MANAGEMENT PROBLEMS OF POVERTY BAY

by

S. MCGUINNESS, GISBORNE.

Area Covered:

When one speaks of Poverty Bay no very defined area is envisaged. It might be said to embrace the five Counties of Cook, Waikohu, Uawa, Waiapu and Matakaoa, extending from approximately 40 miles south of Gisborne to almost East Cape and bounded by the sea on the east and bush clad mountain ranges on the west which run in a more or less parallel line approximately 45 miles from the coast, comprising a productive area of approximately $1\frac{1}{2}$ million acres, and a stock population of

approximately 2,143,000 sheep and 307,000 cattle.

While much of what is written applies to the whole area it is proposed to deal only with the area embraced by the Cook and Waikohu Counties. These Counties have a coastal boundary extending about 20 miles on each side of Gisborne, and extend right back to the mountainous range and comprise an occupied area of 1,044,519 acres, of which 874,500 are classed as productive. Of this it is estimated that 70,000 to 80,000 acres are flat and the balance easy to steep hills.

Soil Types:

The hill country soil is composed largely of papa mudstones and some sandstones, with an occasional outcrop of limestone.

That of the flats is a derivative of papa and mudstone and has been formed largely by flood silting. These are very fertile and are capable of producing excellent crops with little or no manure. Numerous cases are known where good crops of maize have been obtained for four or five years and more in succession with no manure. Yields of one hundred to one hundred and twenty bushels of maize to the acre are not uncommon.

Rainfall:

The average rainfall is 43.41 inches with a minimum of 26 inches and a maximum of 60 inches, although areas nearer the ranges would be higher than this. Generally the hill country receives a more even fall than the coastal area. The main falls occur during the months of May, June, July and August, although summer and autumn floods are not unknown. The fall is only fairly evenly distributed during the balance of the year as a general rule, and dry summer periods occur fairly frequently.

Forest Cover:

The natural cover comprised Kahikitea, Pukatea, Titoki, Cabbage Trees and Puriri with fairly extensive areas of swamp growing Toitoi, and Niggerheads on the flats. The hill country cover was mainly Ngaio, Mahoe and Manuka with Birch, Rimu, Matai and Tawa and occasional areas of Totara on the higher levels further from the coast.

Settlement:

Settlement commenced a little over one hundred years ago with trading and missionary stations on the banks of the tidal rivers and streams, which at that time were navigable to small craft. These settlements gradually spread and one can say that most of the area has been settled and farmed for over forty years.

Pastures:

Pastures on the majority of the flats consist of dominant rye-white clover swards with some areas showing a proportion of cocksfoot and on others paspalum is beginning to appear strongly.

The better class hills have a good sole of English grasses and clovers, while the lighter hills are covered with native grasses and trefoil, with browntop appearing on the higher rainfall portions. Good results have been obtained on the hills where the sowing of subterranean clover in conjunction with superphosphate topdressing has been carried out.

Types of Farming:

A. & P. Statistics show that there are 1,040 holdings of over 1 acre in the Cook County and 405 in the Waikohu County. As most sheep farms of any size have their own shearing plants it is safe to assume that these statistics which show that there are 408 shearing plants in the two areas give some indication of the number of sheep farms.

Type 1: Breeding of sheep and cattle where all surplus stock are sold as stores except in very favourable seasons when some may be fattened. All stock wintered entirely on grass.

Type 2: Breeding and fattening of sheep and cattle where all surplus stock except breeding stock are sold as fats, except in unfavourable seasons. Little, if any, cropping is done for topping off stock, and grass can be said to be the main crop.

Type 3: Fattening of sheep and cattle where all stock are bought in. These farms combine the cropping of maize, pumpkins, peas, potatoes, and seed crops of rye and clover with their fattening operations.

Stock Population:

	<u>Sheep</u>	<u>Cattle</u>	<u>Horses</u>
Cook County ...	728,547	101,618	3,371
Waikohu County ...	611,555	91,087	2,425
TOTAL ...	<u>1,340,102</u>	<u>192,705</u>	<u>5,796</u>

(Cattle figures include Dairy Cattle 19,873)

Area Topdressed - year ended 31/1/46:

Topdressing is not extensively practised. Only 3½% of the total area of productive land being done in the year ended 31/1/46. Superphosphate being the main fertiliser in use. Some lime is used in conjunction with the super, but this is mostly on the flats.

Area topdressed in each County:

Cook ...	14,698
Waikohu ...	16,094

The opinion has been fairly generally held until recent years that the flats were so fertile that topdressing was superfluous. However, this opinion is gradually changing, and most of us who now topdress these flats are satisfied that results make it really worth while. More ready availability of fertiliser since the opening of the Wairoa-Gisborne Railway in 1942 has also contributed largely to increased use on the hills, and now that rationing of supplies looks like being overcome, very much increased use is likely to be made of them.

Management:

Type I:

These largely comprise properties on the higher hill country. A typical flock to be wintered would be as follows:-

Mixed aged Romney breeding ewes
Ewe hoggets
Wether hoggets
2 th wethers
Romney rams

Cattle would be -

Mixed aged herd cows
Mixed sex weaner calves
Rising 2 yr. heifers and steers
Rising 3 yr. steers
Hereford or Polled Angus bulls.

Stock for sale annually on a typical property of this type would be:-

Sheep: 5 yr. ewes
Cull 4th, 6th and 8th ewes
Cull 2th ewes
4th Wethers
Possibly some wether lambs

Cattle: Cull cows (culled for age type and constitution)
Cull 2 yr. heifers
3½ yr. old bullocks.

The ewes would be sold to farmers on type 3 farms, both in Poverty Bay and other districts for mating with Southdown rams for the production of Down cross lambs for the fat lamb trade.

The wethers would be drafted for fats and the balance sold as stores to a similar type of producer as above.

The wether lambs sold would in favourable seasons be fats, but in unfavourable ones be only sufficient to ensure reasonable winter hogget carrying, and maintain sufficient 2th wethers to control the more difficult parts of the property.

No cropping is done on these types, and only a little topdressing. High freight costs combined with difficulties of application such as packing and hand sowing combined with problems of supply in the past few years have all contributed to limit its application. Reliance is placed solely on pasture, and it is a very real problem to ensure that while a sufficient cover of grass is left to carry cattle through the winter period, pastures are maintained in that fresh state which is so essential to healthy sheep.

Type II:

These comprise hill country nearer to the sea and in many cases they have a small portion of flat or easy ground.

A typical flock to be wintered would be as follows:-

Mixed aged Romney X breeding ewes
Ewe hoggets
Wether hoggets (balance of lambs not fattened)
Romney rams

Cattle would be similar to type I with the exception that possibly rising 4 yr. bullocks would be included.

Stock for sale annually:-

Sheep: 5 yr. ewes
Cull 4th, 6th and 8th ewes
Cull 2th ewes
Fat wether lambs
Fat 2th wethers

Cattle: Fat cull cows
Cull 2 yr. heifers
Fat bullocks (4½ yr. old)

Ewes would be sold similarly to Type I. Cull 2 yr. heifers might in some cases be fattened, but generally speaking they would be sold both for breeding purposes and fattening by type III farmers locally and otherwise.

No cropping to any extent is done but a fair proportion of the fertiliser used in the district would be spread on the flats and easier hills, and this country would be utilised for the topping off of fat cattle and the finishing of those wether lambs not drafted as fats off the mothers.

Here, too, pasture is the main crop and the same problem of winter feed for cattle while maintaining it in a suitable stage for sheep occurs, excepting that generally speaking this country is nearer the sea coast and does not perhaps suffer quite such cold winter conditions. On the other hand its rainfall is not so evenly distributed with the result that summer shortages of feed occur more frequently than they do on the higher country.

Type 3:

Confined to the flats and easy slopes flocks would consist of mainly ewes over 4 yrs. old mated to Southdown rams and cattle would depend on the vagaries of the market. Some properties make the practise of buying 3½ yr. and 4 yr. old bullocks and finishing them for freezing, while others buy the cull cows from the herds of the breeders for fattening. Stock wintered on these properties is much more dependent on the vagaries of the climate and markets.

Pasture control for sheep grazing purposes is exercised by the use of cattle, grass and clover seed crops and hay. The aftermath following seed crops and hay is used extensively for the topping off of bought in lambs. Hay, pumpkins and grazing of maize stalks following picking supplement grass during the winter period but few farmers make provision for the dry summer periods. Following the example set by the Manutuke Research Station during the past two years, a few farmers are now growing crops such as turnips and Thousand Headed Kale to feed as a supplement during this period of shortage and also with the object of feeding it while conditions conducive to facial eczema are present. These crops can and are being used for lamb fattening when not required for the above purpose and good results are being obtained.

One property with which I am familiar has since 1943/44 season progressively increased the number of fat lambs drafted by over 160%, and the average weight has been maintained. Much of this increase has been due to the provision of supplementary feed for late summer and autumn.

A shortage of natural water for stock purposes is a problem applicable to the whole district except the areas closer to the mountain range. Prior to the rail providing a rapid outlet for drought stricken stock many thousands of cattle died. One property of 16,000 acres within a 10 mile radius of Gisborne lost 2,000 head in the drought of 1926, and this was not an isolated case. However, the increased use of wells and pumps on the flats and the building of dams on the hill country together with provision of the rail transport has done much to relieve the position. Having seen a few dams in use one feels that much more could be done in this respect. It is significant that whenever a pastoralist builds one dam he soon follows with others. One feels that other problems pale into insignificance when compared with the problem of water shortage. Admittedly more rapid transport by rail has greatly solved the problem of losses but the problem of having herds and flocks which have taken years to build up decimated, even though by sale, is one that is too serious to be taken complacently. Much more could be done to minimise the problem and now that suitable machinery is available for the purpose most hill country pastoralists could with advantage considerably improve their water supply.

Lambing:

Low percentages are a cause of large economic loss. Statistics show that last year both Counties returned the same percentage of 83.8. In comparison Dannevirke returned 92.5%. This is an area with a much more rigorous winter and spring climate, and one with soil that is not recognised as highly fertile. Breeding ewes for both the Cook and Waikohu Counties total approximately 781,000. Could the percentage of these counties be lifted to that of Dannevirke, it would mean an increase of nearly 70,000 lambs. One feels that our percentages are not as high as they could be having regard to our climate and soil, but, of course, it is possible that the same position applies to other areas in N.Z. Who knows ? ?

A contributing cause to low percentages is the number of lambs which are either born dead or die within 3 days of birth. Speaking broadly it can be said that 1 in 10 of every lamb dropped is lost at this time. Preliminary work done last year appears to indicate that there is no relationship to the age of the ewe, to the breed of the sire or the type of country on which the flock are depastured. Figures

which were collected last year show a variation of loss of from 5% to 15% with odd cases over the latter figure. Last year the weather over the lambing period was almost perfect and few losses could be attributed to cold or wet conditions.

Do other districts in N.Z. suffer such a high death rate at this time?

This heavy loss infers that our low lambing percentage is not one of fertility or rather lack of it. Is it pasture management? Is it climate? Does the answer lie with those vague, oft repeated, extremely profitable two words - TRACE ELEMENTS.

A further point occurring which perhaps is not generally realised is that with 83% lambs more than 17% of the ewes - when twins are taken into consideration - are dry and this means that in cases of standard flocks the only return from these ewes for the year's grazing and work is the wool clip. On easy country it is relatively easy to foster one lamb of twins onto a ewe which has lost her lamb, but little of this can be done on the hills, with the result that a bigger percentage of ewes are carried dry there.

On the flats, too, it is easier to shed off dry ewes, and being closer to the markets the loss is minimised by selling the ewes fat at the high values which exist at that time owing to the butchers' requirements.

A practise which is gaining some ground with the Down cross fat lamb producer is to run vassectomised rams with the flock following the taking out of the Down rams. These rams are raddled on the brisket with a preparation of raddle and castor oil. Most empty ewes can be run off in this way and are available for sale during the winter and early spring, thus reducing the sheep carried at a time when growth is at its lowest ebb, and when every mouth to eat it counts.

The loss sustained by the hill country pastoralist is much more serious than that of the Down cross lamb producer, and anything which can be done to minimise his loss would be a real contribution to the solution of one of his really difficult problems.

After producing his 83 lambs for every 100 ewes put to the ram the fattener finds when he kills them that they do not kill out at weights equal to the man with apparently the same feed in other districts.

Time has not permitted the production of enough figures to really prove the contention, but sufficient have been collected from the Meat Board to indicate that it is worthy of investigation.

The following figures show that taken over 4 seasons Gisborne East Coast lambs are invariably lighter than the average for the whole of the North Island and their average is less than in any one of the other 3 districts.

AVERAGE WEIGHTS LAMBS AND WETHERS								
DISTRICT	SEASON 1942-43		SEASON 1943-44		SEASON 1944-45		SEASON 1945-46	
	Lambs lbs.	Wethers lbs.	Lambs lbs.	Wethers lbs.	Lambs lbs.	Wethers lbs.	Lambs lbs.	Wethers lbs.
AUCKLAND	33.09	54.09	32.38	54.37	34.02	59.88	31.05	53.58
WELLINGTON/TARANAKI	32.49	56.02	32.42	55.77	34.88	60.09	32.14	56.25
HAWKE'S BAY	32.00	54.62	34.10	57.26	33.99	60.26	30.59	54.21
GISBORNE/EAST COAST Incl. WAIROA	31.22	53.51	32.16	54.87	30.99	55.71	29.88	50.91
TOTAL NORTH ISLAND	32.45	54.90	32.75	55.65	34.20	59.18	31.39	54.35

To go a little further the following figures covering the first 3 months of the 1946/7 killing season show more startling results:-

LAMB KILLINGS - 1946/47						
DISTRICT	NOVEMBER		DECEMBER		JANUARY	
	Aver. Wgt. lbs.	% 2nd Grade to total	Aver. Wgt. lbs.	% 2nd Grade to total	Aver. Wgt. lbs.	% 2nd Grade to total
AUCKLAND	35.17	5.98	35.43	9.7	35.23	16.29
WELLINGTON/TARANAKI	35.41	2.83	36.27	3.71	36.20	7.14
HAWKE'S BAY	36.48	4.11	37.08	6.63	35.79	17.38
GISBORNE/EAST COAST Incl. WAITROA	31.60	19.21	32.34	27.74	32.48	32.57
TOTAL - NORTH ISLAND	35.23	7.37	35.66	9.73	35.69	12.88
Difference between Gisborne East Coast and N.I. Average	3.63		3.32		3.21	

That these facts have been recognised by the fatteners in other districts and have enabled them to compete on the store lamb and store sheep markets of Gisborne is proved by the following figures:-

Between 1932 and 1944 figures show that the kill at Tokomaru Bay and Kaiti decreased during that period by approximately 36% and representing a drop in sheep and lambs of 270,000. Flocks as shown by the respective sheep returns were 2,321,230 and 2,317,525. The percentage of killings to flocks fell from 33.8 to 21.7. It is apparent that a good deal of this stock was lost to the Auckland District for the kill at the works in the Auckland Province increased by 111% representing approximately 1,000,000 sheep and lambs. Certainly their sheep disclosed an increase of over 66% and the percentage of killings to flocks increased from 39.2 to 49.8.

The contention is expressed by the fatteners of cattle that their position too is similar to the above. No attempt has been made to collect figures to support or disprove their contention, but it is significant that outside buyers with a freight or droving penalty of at least 10/- per head can compete strongly on the Gisborne market, and they do, in fact, take a large proportion of the fattening cattle offering.

Hill Country Deterioration:

One often hears the statement that the carrying capacity of the Poverty Bay hill country is deteriorating. A number of the station owners, on the back country particularly, have during recent years, owing to labour difficulties, reduced their sheep flock and increased their cattle only to find that their sheep have "done" better and their wool returns increased. This raises the question of sheep to cattle ratio and figures from a station of 33,787 acres covering the 10 yr. period 1929-1938, and the 8 yr. period 1939-1946, make very interesting reading and prove that where the cattle ratio is high sheep carrying and production can be maintained on country which is typical of much of the district. Average No. sheep wintered 10 yr. period 1929-1938 37,985. Average No. Sheep wintered 8 yr. period 1939-1946, 37,608. Average No. Cattle wintered 10yr. period 1929-1938, 4,703. Average No. Cattle wintered 8 yr. period 1939-1946, 5,287.

Wool Clipped 1936-1937 season	...	368,498 lbs.
1937-1938	...	356,538
1938-1939	...	384,336
1939-1940	...	344,130
1940-1941	...	357,948
1941-1942	...	406,181
1942-1943	...	381,848
1943-1944	...	376,908
1944-1945	...	360,237
1945-1946	...	354,260

Final returns for 1946-1947 are not yet to hand but they are approximately the same as 1944-1945. It will be noticed that during the 1941-1942 season the clip was above average, but this is accounted for by the fact that in that season approximately 1,650 more sheep were shorn. If we allow for this we find that the weight of the clip has remained remarkably consistent.

The ratio of sheep to cattle over the 18 yr. period is 7.61 sheep to 1 cattle beast. This is from the sparse information I have been able to gather, lower than on the average property.

Based on A. & P. Statistics the ratio for the two Counties is 7.81 sheep to 1 cattle beast, and these statistics would include the fertile flats where the ratio would be lower.

The average carrying capacity per acre for the 18 yr. period is 1.12 sheep and 1 cattle beast to 6.8 acres.

To give a brief picture as to the type of this particular station it is described as approximately 20,000 acres of good sound sheep country ranging from papa and clay formation to light terraces, approximately 7,000 acres light country inclined to revert to manuka and approximately 7,000 acres of high, cold pumice and sandstone birch country which rises to an altitude of 3,500 feet. The main area ranges in altitude from 900 feet to 2,000 feet.

Summing up one is inclined to the opinion that apart from the areas which will revert to second growth in spite of every effort the deterioration of hill country is largely a matter of proper stocking and management, both of which are frequently governed by lack of finance.

Pasture Management:

While it is relatively easy to grow pasture, the utilisation of it in a district such as this where it is the sole ration in the majority of cases over the late winter and spring period, is a matter of primary importance. To ensure that sufficient feed is provided to avoid the low plane of nutrition prior to lambing which causes sleepy sickness and at the same time avoid that over supply of fresh green grass which results in milk fever appearing 2 or 3 days prior to lambing is an aspect of pasture management for which the sheepfarmer must be continually on the watch. That so relatively little of these complaints appear says much for the ability of our farmers in pasture management.

Diseases and Parasites:

The diseases causing loss by death or reduction of productivity of the grazing animal are:-

1. A form of staggers which occurs in both sheep and cattle and in certain localities horses. Few deaths occur from it in sheep and cattle, but where neglected it is almost invariably fatal in horses. It is invariably associated with ryegrass in several stages of its growth, and is always seen in the summer and autumn. Its association with the growth stage of the rye is difficult to determine because for example this year the main outbreak occurred approximately two weeks after the autumn rains came, whereas last year it occurred during the dry period of summer.

Although it does not often cause death it causes real difficulties when it comes to mustering, and is a serious setback to the fattening of both sheep and cattle. Older sheep appear to be more resistant to the complaint than young ones, and in certain areas its incidence is much worse than others.

2. Facial eczema has in past years caused serious loss. Few cases of it have occurred for the past three years. However, it must be recognised as a menace which will recur when climatic and feed conditions suitable to it coincide.

3. Contagious abortion has been diagnosed all over the Poverty Bay area. Present calving percentages at from 60.75% do not satisfy most breeders. Some 8,000 heifers have been vaccinated by the Veterinarian of the Gisborne Vet. Club during the past year and the result of this large scale effort at control are awaited with interest.

4. Internal parasites take their toll both in sheep and cattle. The use of phenothiazine as a drench is becoming widespread and this, together with more careful attention to the suitability of feed for young stock, is doing much to minimise the losses that occur. Several properties in the area are making a practice of drenching calves at weaning and on one property with which I am associated, 600 calves were treated last year and while no controls were kept the results appeared highly satisfactory, and we propose to continue with it.

5. Foot rot is prevalent more particularly on the flats than on the hills. The economic loss as a result is difficult to assess. In our own case the cost of labour alone in efforts to control it run into a high figure.

6. Cancer Eye: Not reported in Polled Angus, but Hereford cattle appear to be very subject to it, one herd was reported to have 30% of herd cows affected. It is not suggested that this is typical, but few breeders of Hereford cattle escape. Good work is being done by the Gisborne Veterinary Club in controlling it where cases are reported early enough.

7. Other diseases which cause losses to a lesser degree are Pizzle rot in wethers, Pink eye (a transient blindness making mustering impossible during the 4-6 weeks infection, and cases of up to 20% of a flock have been reported), Fly strike, Woody tongue, Lumpy Jaw.

Fluke in both sheep and cattle is reported in certain areas, but our knowledge of it is too scanty to define the area.

While individually these latter diseases do not present a serious problem, collectively they must be the cause of considerable economic loss which is well worthy of investigation.

Teeth: One often hears it reported that the teeth of Poverty Bay sheep are deteriorating. Certain small areas have a name for sheep with good teeth, but on the whole they do not compare favourably with those of many outside districts and any investigation which will throw some light on the question will gain the support of the majority of Poverty Bay sheepfarmers.

Summing up it appears that the problems of a Poverty Bay sheepfarmer are mountainous, and you may wonder why any of us consider the game worth while.

Knowing the problems of farmers in other districts I feel, however, that farming problems in Poverty Bay are relatively not nearly so black as I have painted them.

We do enjoy a climate which compares more than favourably with any other part of New Zealand, and the sun does shine occasionally to the extent of an average $6\frac{1}{2}$ hours per day for every day of the year, taken over a five year period.

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R. Crawford, Veterinarian, Gisborne Vet. Club, for information supplied.

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DISCUSSION ON Mr. McGUINNESS'S PAPER:

Dr. McMEEKAN: Personally I would like to thank Mr. McGuinness for giving us a picture of the angle of farming that most of the workers in the field of animal production know little about. Mr. McGuinness is responsible for properties carrying round about 70,000 sheep and 7,000 head of cattle and can speak accordingly with some degree of authority. I have been interested in what he had to say in respect to the three problems to which he has drawn our attention, the problem of low fertility in the Poverty Bay sheep (83 per cent. is the lambing percentage over some years) the question of lambing losses and the problem of slow growth in lambs. We are accustomed to think too much in much of our work of problems of the low level intensively farmed areas forgetting that to a very large degree the prosperity of those areas is related to the maintained productivity of the hill country which is the source of supply for the fat lamb ewe. I would like to emphasise that in those three problems there are many headaches for research workers and I hope that Mr. McGuinness's talk will inspire them to tackle them. Has Mr. McGuinness had any experience in the use of pampas grass in his area in relation to his winter problems of cattle feeding to which he refers? I would also like to know whether it is true that the lambing percentage in the Gisborne area has declined over the years or whether the 85 per cent. has been always characteristic of that area?

MR. McGUINNESS: So far as pampas grass is concerned it is grown in Poverty Bay but on a small scale. Dry seasons over the past two years have not helped its establishment where it has been planted. I believe it has a place in our farming management. So far as the lambing percentage is concerned it does not appear from information I have been able to gather that it was ever much higher than it is today. We do find that on a lot of the hill country the lambing percentage appears very favourable when compared with that on the flats. For example, at Waipaca Station the percentage runs up to 95 per cent. I do not think the average would be 90 per cent. on the flat land.

DR. WALLACE: In Mr. McGuinness's experience does he find in years when he has a good lambing percentage any association with a lower incidence of barrenness? Does an increase in the number of twin lambs tend to be associated with a lower number of dry ewes?

MR. McGUINNESS: I do not think I can answer that very well. Sufficient attention has not been paid to the problem of lambing losses. Although it has been recognised and accepted as part of the problems the district has to put up with, only in recent years have we taken notice.

MR. LAING: Can anything be done about the problem of slaughtering? I think on three occasions during the last nine or ten years there has been very heavy slaughtering on the East Coast in cattle and these slaughterings have resulted in difficulties in pasture management during the following few months. I have often wondered whether some sort of action could not be taken to conserve young cattle. I was very interested in what Mr. McGuinness said about the incidence of rye grass staggers this year. Exactly the same trouble has been experienced in parts of Hawke's Bay.

MR. McGUINNESS: Slaughtering of female cattle suitable for breeding has always rather disturbed us. Theoretically one does not like to see such heavy reductions in cattle numbers but practically we have very often no other solution. During the dry periods experience in the last two years stock has been reduced in amount by heavy slaughtering, but at this season's fairs it has been surprising to see how many cattle are still offering.

MR. SMALLFIELD: There is one point I would like to raise and that is in connection with the lambing percentages of counties. They must be taken with great reserve particularly when you compare counties devoted to extensive sheep farming over a period of years. I went carefully into the lambing percentages in the Waikato county where you

have a decreasing lambing percentage. During development quite a considerable number of ewes entered the county after the 30th April, resulting in a distorted lambing percentage figure. It would suggest a high initial level which has gradually decreased as the farming became generally more stabilised. Movement from county to county does upset lambing percentage over a long period.

MR. MCGUINNESS: I do not think that would apply very much to our area. I should think there would not be a great movement of stock after 30th April.

DR. WALLACE: In connection with the low fertility in the Gisborne district. When selection is made of those ewes that are to be kept for breeding is there a general tendency to keep those hoggets which are well grown and hence are more likely to be single lambs than twin lambs? There is a greater growth in lambs that are single than in twins and obviously the pressure of selection would be against that type of ewe which produces twin lambs. This may be an important factor in leading to a low fertility of the Romney breed as a whole and in particular with reference to the Gisborne District.

MR. MCGUINNESS: That is quite possible where many of the Romney lambs are born and bred on the hills. Undoubtedly when the selection of hoggets or 2th ewes is made for flock replacement the better grown ones (everything else being equal) are the ones selected and it is more than likely that twin lambs are neglected as a result.

DR. WALLACE: By selecting continually twin lambs over a period of years you can raise the proportion of twin to single lambs.

MR. CRAWFORD: There are three points that occur to me. First, pasture management and dams. In country where water is a long way from the hill tops quite a number of the graziers have found that cattle will work as a mowing machine further up on the hills if dams are built near the hill tops. That is one facet of the dam building aspect that Mr. McGuinness has not mentioned. Regarding this lambing percentage problem. It seems quite clear that if you take the wet ewes and ewes that are not suckling a lamb at weaning time and run them as separate flocks, the following season the former compare just as well with those that reared a lamb the year before. That is the story everywhere you go. Those figures have been kept by the farmers. I think that Dr. Wallace's contention that selection pressure against twins prevails is quite right because selection for the well grown hogget definitely takes place.

MR. WARD: I can quite see Dr. Wallace's point about the selection against fertility, but Mr. McGuinness has used a comparison between counties and I should think this selection factor operates reasonably uniformly over most counties. Is this so? The second point is that in dairy cows over a fairly large scale survey we found that of cows retained in the herd but empty at the end of the season, 80 per cent of them are successfully mated the following season, indicating that the temporary sterility problem is the major one in dairy cattle.

DR. WALLACE: The selection against fertility hits Gisborne and other Romney breeding districts particularly for the reason that ewes which have been culled from flocks in such places are more likely themselves to have been twins and are more likely to possess a higher inherent fertility.

DR. McMEEKAN: I got the impression that it might be gathered that this characteristic of a mortality of 10 to 15 per cent. lambs within the first three days of birth is typical only of the Gisborne area. Personally I doubt that very much. In fact, of three other areas in New Zealand where I personally have been responsible for the collection of records I think that that figure is typical of each of those areas, viz., Canterbury, Manawatu and Waikato. I am not suggesting that it is not a problem. It obviously is. But I am suggesting that it is not a problem that the Gisborne District has on its own.