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### Weight trends in fattening cattle

M. Cullity

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# Weight Trends in Fattening Cattle

## Six Years' Trials at Wokalup Research Station

By M. CULLITY, B.Sc. (Agric.), Superintendent of Dairying

**T**HIS work was commenced as part of the co-ordinated plan of investigations into beef growth rates in the southern regions of Australia, and was referred to in the introductory note "Beef Growth Rate Studies" published in this Journal (Vol. 5, No. 4, July-August, 1956). For the period 1950 to 1953 inclusive, an endeavour was made to procure evidence showing the trend in weight gain according to the seasons of the year. In the 1953-54 season and since, the work has been varied to measure the growth rate of steers which were grazed on irrigated pasture during the summer months, in comparison with others grazed on dry pasture at that time.

### DESCRIPTION OF PROPERTY

The Wokalup Research Station is situated 91 miles from Perth on the main south-west highway. It comprises 2,200 acres on the foothills of the Darling Range and the coastal plain, and has approximately 750 acres under pasture. Its natural tree cover was red-gum and jarrah. Its initial development was commenced by a private owner approximately 100 years ago. The soils vary from heavy, medium and light clays adjacent to the foothills, to red and brown loams on the hill country with occasional granite outcrops. Some sandy loams occur on the flats. Some of the higher sections are lateritic. Deeper loams follow the gullies and good alluvial soils exist where these open on to the flats. The grazing areas with the exception of the irrigation paddocks, have a reasonable number of natural shade trees.

The climate is of the Mediterranean type, characterised by heavy winter falls with very dry summers. The distribution of the rain is shown in the histograms accompanying the graphs in this report. There are seasonal changes in the character of the pastures accompanying the climatic changes. The period of natural green grazing extends usually from April-May to November-December. A reasonable growth of pastures is obtained after the first autumn rains, but growth usually stops in July when the ground is very wet

and cold. More rapid growth follows with the advent of the warmer days of spring, and maximum growth is obtained about the end of October with hay-cutting starting during the first or second week in November. In summer the herbage is dry, except on the flats at the foot of the hills, which contain a good deal of couch. The bulk from this, however, is not great unless a good fall of rain occurs, but then is available only for a limited period.

The pastures consist mainly of annual species including midseason subterranean clover (Mt. Barker), ryegrass, minor clovers such as suckling and cluster, with some medic, and minor grasses such as spear, barley and silver grasses. On the flats and some of the older paddocks, a couch base occurs which provides some green picking during the summer months. It is associated with perennial and annual ryegrasses in addition to the annual species already mentioned. In the hills some scrub areas were in each paddock. These are not taken into account in assessing stocking rates.

In describing the grazing by the stock in the various projects, the names of the paddocks will be given. The following key will assist in obtaining a ready knowledge of the constitution of the pasture.

Flats, Extended Flats, Windmill, Camp and Camdens paddocks all refer to the dry land pasture with a sole of couch.



Bull paddocks Nos. 1 and 2 are lower hill paddocks with a partial couch sole and less ryegrass than the flats.

Hills, Experimental, Camdens Hill, Fry's Hill, Burma Road—are generally similar to the pasture in the bull paddocks, but without couch and with a much lower proportion of ryegrasses than the flats.

Generally the carrying capacity of the paddocks under the general description of flats, was higher than those on the higher ground.

These dry land pastures produce a heavy bulk of green feed during the late winter to the early summer months and provide excellent dry grazing for the 3-4 dry months of the year. They are top-dressed annually with 2 cwt. of superphosphate per acre.

The main south supply channel from the Stirling dam traverses the property, and commands approximately 250 acres suitable for irrigation. During the last three years, some 110 acres of high quality irrigated pastures have been established under the border system of irrigation. The species used include white and strawberry clovers with paspalum, cocksfoot, H.1. and perennial ryegrasses. These paddocks are watered during the summer months at three-weekly intervals with 4-5 in. of water per acre. The first watering usually takes place in December and the last in March or early April. Superphosphate is applied twice per year, in autumn and in late spring at the rate of 2 cwt. per acre per application. Grazing is by cattle, and in summer, on a rotational system of strip grazing using an electric fence.

### **WEIGHING PROCEDURE**

Weighing was carried out on a clock-face cattle weighbridge at intervals of 28 days. To allow identification of individuals and the progressive recording of their weights, all cattle were eartagged.

On weighing days cattle were mustered about 8.30 a.m. and weighing completed and the animals returned to grazing by about 10.30 a.m. Every endeavour was made to have the routine of mustering and weighing carried out in the same way each time.

Despite this however, environmental conditions varied and consequently the animals reactions in respect to grazing, watering, defecating, etc., varied with resultant influences on weight. The possibility of yarding all cattle overnight in order to have all in the same approximate degree of emptiness was considered as a means of removing some of the monthly variations, but as the establishment of trends of growth was the major objective, it was decided that the extra preciseness of individual weights would not warrant the additional discomfort for the stock or work for the staff. An examination of the tables for the average weights and weight movement at the end of this report will show several occasions when the recorded weight at a particular weighing was probably not the true weight owing to the animals being in a condition of relative emptiness when compared to other weighing dates. Quite frequently there were individual cases and occasionally with the group averages there has been an unexpectedly small increase in weight followed at the succeeding weighing by an apparent increase of about double that anticipated. The averaging of these gains gives frequently a curve of gradual trend.

### **SOURCES OF STOCK**

The cattle were not selected specially for this study, but those which were readily available were used. The main supply was from those bred on the Research Station, and included a number of dairy steers in the early stages, and later the bulk were Poll Hereford-cross steers. These were the male progeny of a project in the grading up of a commercial Hereford herd from reject dairy cows. Two groups only were purchased outside the resources of Government farms, and not specifically for inclusion in this work, but to build up total stock numbers to utilise the abundance of feed. These groups were the 33 station-bred steers and the 40 mixed dairy steers both of Project 2.

Other importations on to the property were from the Pardelup Prison Farm, which was relieved of part of its surpluses, both of A.I.S. steers from its dairy herd and of Poll Hereford A.I.S. steers from a beef herd grading up project, using grade A.I.S. females and Poll Hereford bulls with



a similar objective to that at Wokalup. Poll Herefords were used exclusively and where the word Hereford appears in this report it should be read to mean Poll Hereford. Other A.I.S. steers were bred in the pure bred A.I.S. herd of the Claremont Mental Hospital. These were taken over when only a few days old and reared on milk substitutes at Wokalup.

## PROJECT 1

### Objective.

As outlined in the general introduction to the reports on beef growth trend investigations in this State—see *Journal of Agriculture* September-October, 1956—it was planned to gain knowledge of the movement in weight of cattle being fattened during the changing seasons of the year and under normal management. This means that no attempt was to be made to give the cattle in the study special attention or feeding. The basic preschedule prepared for all the centres throughout the Southern States envisaged the collection of data for a period of five years, without attempting to vary or improve management. However, owing to the recognised regular pattern of the climate in the West Australian agricultural areas, it was agreed that three years' data should be sufficient to fix reasonably accurately what might be considered the normal pattern of growth.

Beef type cattle were not available but sufficient dairy steers were on the property and it was decided to work with these. As it was planned to introduce cross-bred beef animals in following years, the opportunity would occur of comparing the growth trends to ascertain whether there were any differences due to breed or type, or whether movements in weight were a reflection of the feed intake.

### Stock.

Thirty-five steers bred from dairy cows and reared on their dams, were selected. These comprised 15 Jersey, 13 Australian Illawarra Shorthorn, and 7 Guernsey. They were not pure-bred stock, but grade animals or crossbreds showing the characteristics of one or another of the above breeds. They were the progeny of reject dairy cows from a heifer-buying and mat-

ing scheme, operated after the war to provide cows for War Service Land Settlement farmers. Their ages varied at the commencement of weighing from approximately 15 months, to 2½ years.

### Seasonal.

In the spring of 1950, grazing was prolonged slightly owing to rainfall being above average and extending to the end of November. After the dry months of summer, the opening rains of the next season fell in early April and annual pastures germinated about April 11-12. The remainder of 1951 followed a normal pattern, except for lighter than average rainfall in September, which had little adverse effect on the amount of herbage.

### Grazing.

Grazing was carried out in various paddocks as under:—

October 30, 1950 to January 14, 1951—  
Oat crop and stubble.

January 14, 1951 to May 15, 1951—  
Hills.

May 15, 1951 to August 8, 1951—Hills  
and flats, alternatively at approximately weekly changes.

August 8, 1951 to October 25, 1951—  
Flats.

October 25, 1951 to January 17, 1952—  
Hills paddocks.

Stocking concentration for grazing varied from one beast per acre to one beast per two acres over the major part of the time. During the months of January to May of 1951, the stocking rate on the hills grazing was three acres per beast.

### Growth Trends and Rates.

The growth curve in Fig. 1 shows two periods of rapid increase in weight from October 30, 1950, to December 19, 1950, and from May 15, 1951, to December 20, 1951. In the next three months weights were relatively static, followed by a substantial decline in weight in April of 1951.

The movements in weight for these periods were:—

From October 30, 1950 to December 19, the average weight increased by 105 lb. from 884 to 989 lb. or by 2.14 lb. per day.



# INDIVIDUAL GROWTH CURVES

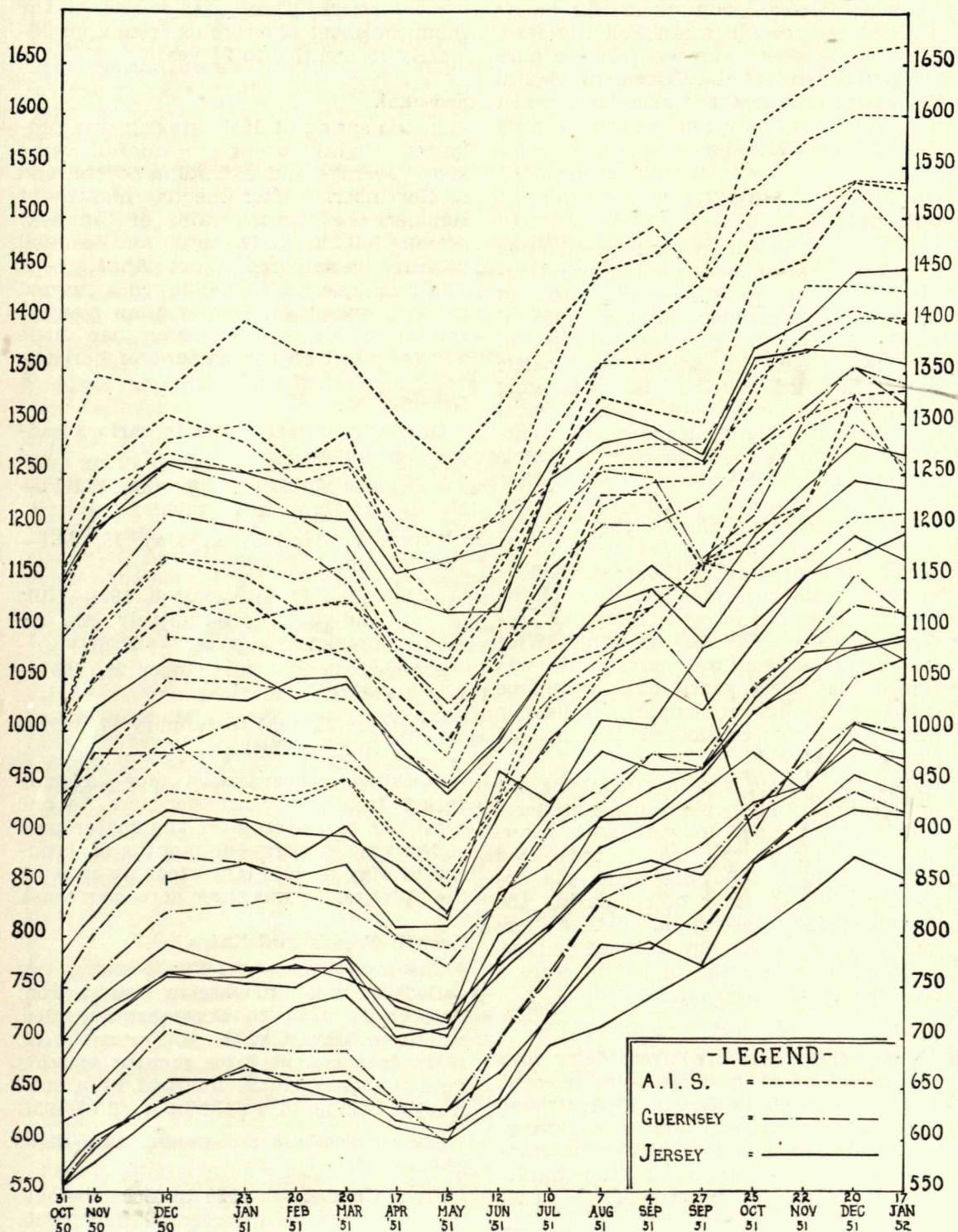
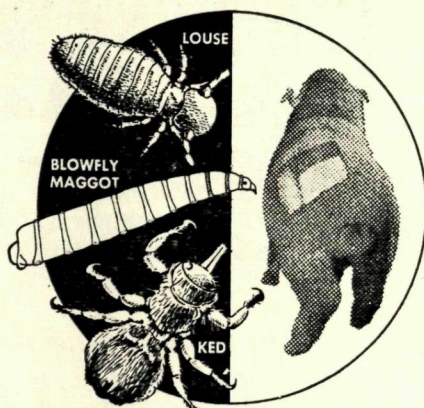


Fig. 1



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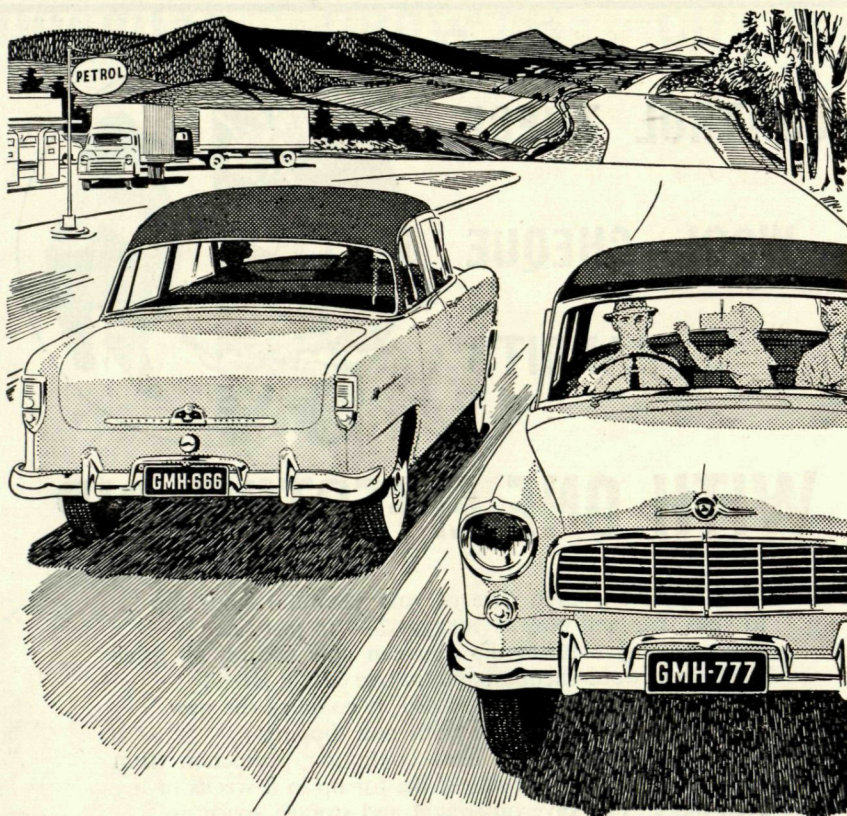
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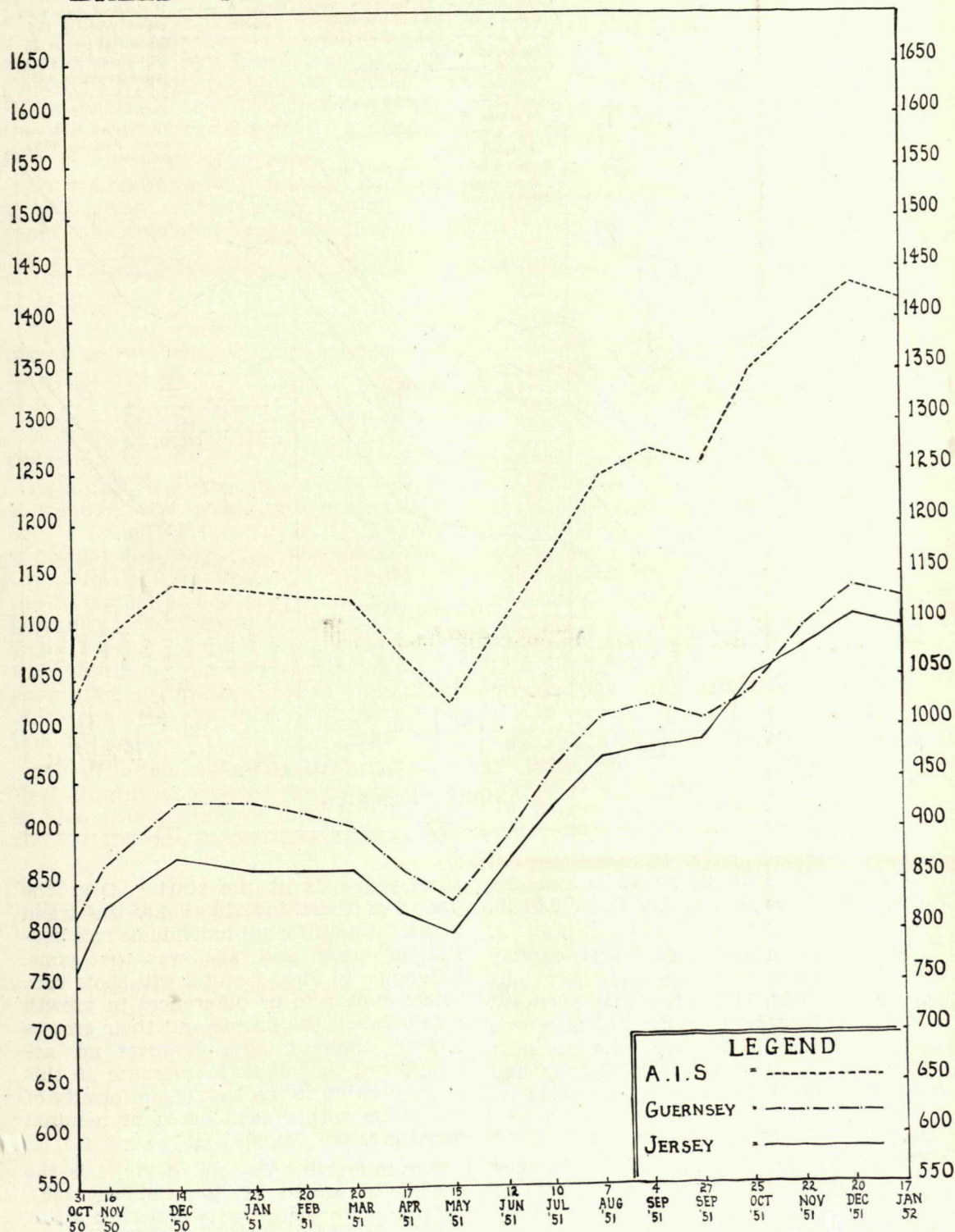


Fig. 2



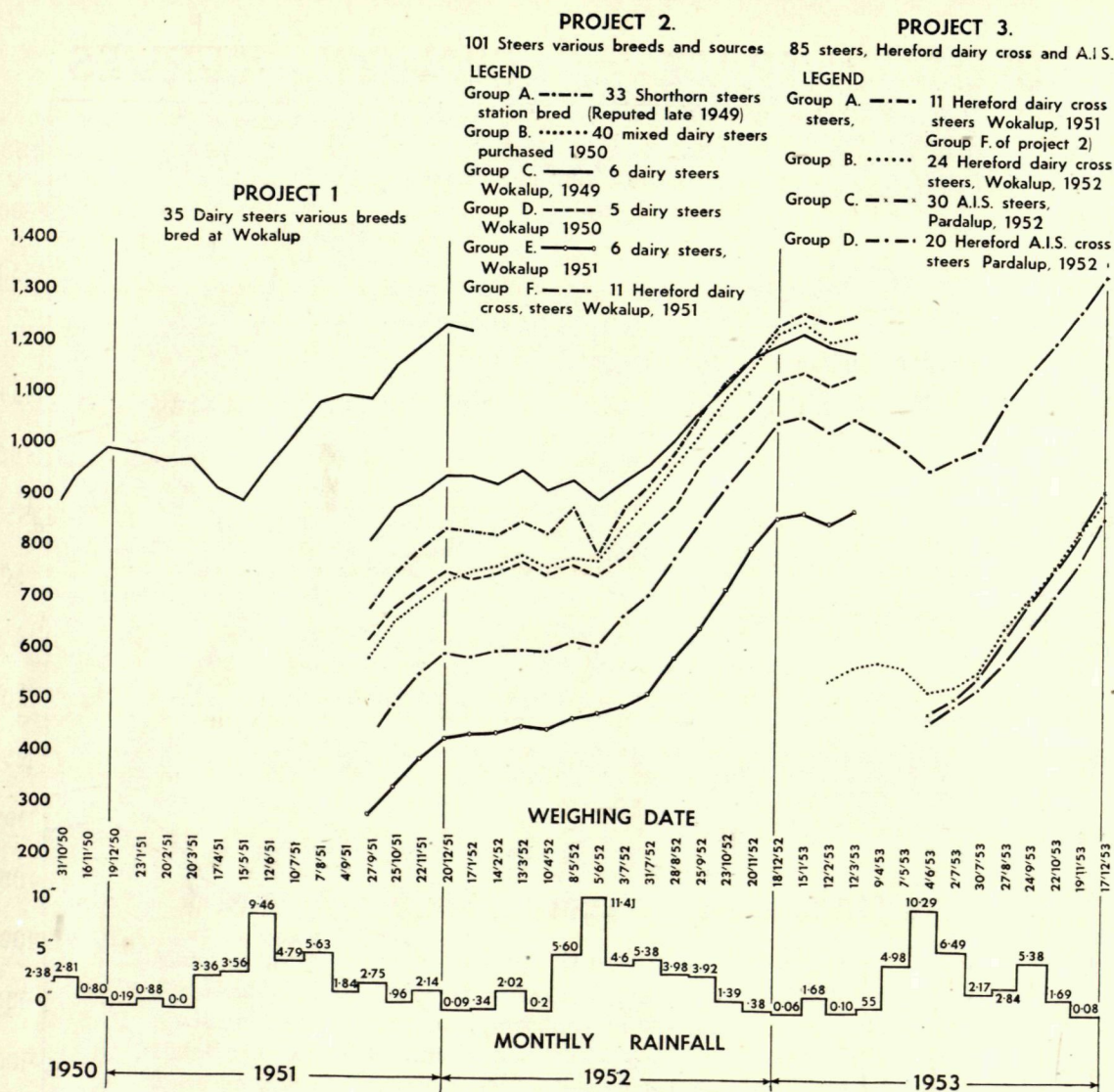


Fig. 3

By May 15, 1951, however, it had declined to 889 lb., i.e. by 100 lb. or 0.67 lb. per day.

From then, however, they grew rapidly till they achieved their maximum weight at December 20, 1951, when they averaged 1,237 lb. The gain in the 219 days was 348 lb. or 1.59 lb. per day. By the next weighing on January 17, 1952, they had again lost weight to the extent of 11 lb.

### Discussion.

The cattle in this project were a very mixed group. They were dairy steers of various breeds and crosses of breeds. They were all ages from yearlings up to nearly

three-year-olds at the start. Over the period of these investigations, the trend in weight gain for all individuals irrespective of breed and age, was the same. Reference to Figs. 1 and 2 will show this. There appear to be differences in growth rate between the breeds and their crosses and at different ages—however no attempt can be made to measure if this were so owing to the lack of uniformity of the cattle within each breed or nominal breed cross.

One interesting feature of Fig. 1 is the decline in weight at the October, 1951, weighing. The cattle were dehorned about two or three weeks previous to this on



September 16, and although there was no apparent disturbance to the animals, it is of interest that at the following weighing, even though the feed and seasonal conditions were satisfactory, all animals showed a loss of weight. It cannot be stated precisely that this loss of weight was due to the dehorning, but the coincidence is reported.

An examination of the weighings prior to dehorning, suggests that possibly another abnormal but unknown influence was responsible. A setback at this period of the year was not expected, nor repeated in later trials.

The rate of growth of this Group of mixed dairy steers, was considered very satisfactory.

## PROJECT 2

### Objective.

As indicated in the objective of Project 1, the plan was primarily to collect data over a period of three years to establish a normal growth curve. The disposal of the animals from Project 1 necessitated the formation of new groups, and the opportunity was taken of including animals from various sources, while complying with the main aim of collecting data on growth trends, to demonstrate uniformity of response in the time of gaining and losing weight.

The inclusion of a group of station-bred Beef Shorthorns enabled the first attempt at the accumulation of data to compare the performance of beef and dairy steers.

### Stock.

One hundred and five mixed steers were used from the following sources:—

- (a) Thirty-three (33) station-bred Shorthorns born in late 1949 were purchased.
- (b) Forty (40) steers of dairy breed, but predominantly Australian Illawarra Shorthorn, were purchased from local sources.
- (c) Six of the original steers of Project 1 were retained. These included 2 grade Jerseys, 1 Guernsey, and 3 Jersey Cross Shorthorn. They were born in autumn 1949.

- (d) Five (5) 1950 drop steers of which three (3) were predominantly Jersey and two (2) Guernsey. These were bred on the property, the progeny of cows sold to local dairymen.
- (e) Six (6) 1951 drop grade dairy steers including four (4) Shorthorn, one (1) Jersey and one (1) Guernsey.
- (f) From a project of grading up a commercial Hereford herd from a foundation of reject dairy cows, using polled Hereford bulls, eleven (11) steers born in 1951 were selected. Six (6) were from Jersey cows, three (3) were from cows of Friesian type, while one (1) each was from cows of Shorthorn and Guernsey type.

### Seasonal.

This project extended from September 27, 1951, to March 12, 1953. The climatic characteristics meriting description were an unusually dry April when only 12 points of rain fell. The opening rains did not occur until the first week of May, and hence there was little green pasture available until June. The rainfall in June (11.41 inches) was well above average. July recorded 4.60 inches only, but the falls in August, September and October (5.38, 3.98 and 3.92 inches respectively), were very good, and resulted in particularly good growth of pasture throughout the spring, and a slightly longer grazing period before hay cutting.

From September 27 to October 26, the couch flats were used. For the following approximately three months till January 17, the cattle were kept on the hills, being returned to the flats again until February 14. Until May 8, they had free access to hill and flat pasture, thence to July 3 apart from one small section which alternated from flats to green oats and back, hill paddocks were used. 100 acres of green oats plus 20 acres of pasture were then used continuously till August 25. For the next five months to January 15, hill pasture with access to bush was available. Following that until March 12, flats were again grazed with some broken bales of hay left from hay making.



## Growth Rates and Trends.

These groups were weighed for the first time on September 27, 1951, when the average weight was 599 lb., and continued under observation until March 12, 1953, when an average of 1,198 lb. was recorded. Over the whole of this period of 476 days, the average increase per beast was 599 lb. or 1.12 lb per day per beast. The maximum average weight however (1,211 lb.) was achieved on January 15, 1953.

Within this 105 head, it is possible to consider six groups, according to the sources or age of the cattle, as set out in the general description under "stock." The weight trend for these were as follows:—

(A) Thirty-three (33) steers from station-bred stock. Their weight at September 27, 1951, was 687 lb. They increased to 839 lb. by December 20, 1951, i.e. by 152 lb. or 1.81 lb. per day. From that date, there was little movement in weight until the following June. At June 5, the average weight was 794 lb. or 45 lb. less than at the December weighing. From June 5, 1952 to January 15, 1953, they gained 467 lb. or 2.12 lb. per beast per day. Recording continued until March 12, with no real variation in the weight.

(B) Forty (40) mixed dairy steers from South-Western sources. These gained 174 lb. or 2.1 lb. per day, from September 27, 1951 to December 20, when they weighed 758 lb. There was a very slight increase in weight to 780 lb. by June 5, From that date until January 15, 1953, a period of 224 days, they gained 470 lb. or 2.11 lb. per day to an average of 1,250 lb. A loss of weight amounting to an average of 22 lb. per beast occurred by the weighing on March 12, 1953.

(C) Six (6) dairy steers born in 1949 were carried over from Project 1. These were the heaviest animals in Project 2 weighing an average of 819 lb. on September 27, 1951. By December 20, 1951, they had gained 127 lb. but by the 5th of

the following June they had declined to 904 lb., a loss of 42 lb. From June 5, 1952 to January 15, 1953, they gained 322 lb. or 1.44 lb. per beast per day, the average weight then being 1,226 lb. There was a slight falling off in weight amounting to 29 lb. by the March 12 weighing.

(D) Five (5) 1950 drop dairy steers. The commencing weight on September 27, was 623 lb. By December 20, this had risen to 755 lb. a gain of 132 lb. The weight at June 5, was 4 lb. less (751 lb.) but by January 15, 1953, the animals had gained an average of 408 lb. to 1,159 lb., or in the period of 224 days 1.82 lb. per day. A small loss of weight of 9 lb. occurred by March 12.

(E) Six (6) 1951 drop dairy steers. The weight trend in this group was a little different from the others, inasmuch as the animals continued to grow even at a slow rate during the summer and autumn months. They were very light at the start, but grew satisfactorily throughout. They gained from 289 lb. to 433 lb. from September 27 to December 20, 1951, and then rose slowly to 485 lb. on June 5, following. In the next 224 days to January 15, they gained 397 lb. or 1.77 lb. per beast per day. There was no loss of weight in the following two months.

(F) Eleven (11) Hereford dairy cross steers were calved 1951. These animals were weighed while still with their dams and their average weight on September 27, was 426 lb. They were weaned after the November weighing, when they recorded 561 lb., or a gain of 135 lb. in the two weighing periods (56 days). They continued to grow until December 20, when their average weight was 600 lb. They had put on 174 lb. in 84 days or 2.07 lb. per day. A further slight improvement in weight was recorded by June 5, 1952, when 614 lb. was





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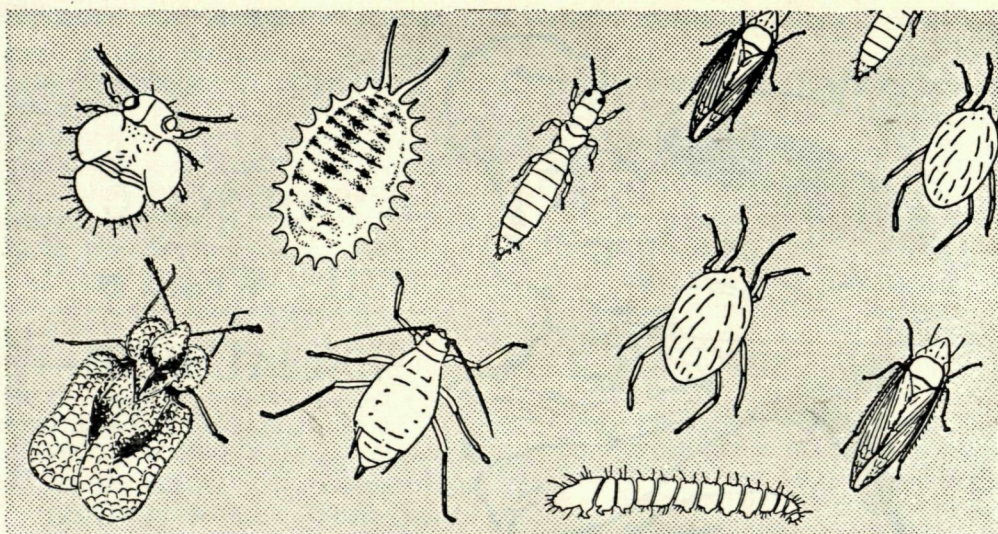
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recorded. During the following 224 days to January 15, 1953, they grew at the average rate of 2.02 lb. per day, or an increase of 454 lb. for the period to a maximum weight of 1,068 lb. There was only a very slight decline in weight by March 12, 1953.

### Discussion.

The main objective of Project 2 was to continue the collection of data to establish what might be considered a normal growth curve for this district. The results of the trials show that there is no difference in the period during which weight increased or was lost, from that established in Project 1. The cattle grew rapidly during the winter and spring months, and maintained their weight for some months during the summer, and then lost weight in the autumn and early part of the winter.

There were six different groups of cattle obtained from various sources. No difference in the trend of weight gain could be detected as related to the source of cattle, nor to their type. Attempts were made to investigate the influence of feeding the animals on green oats, but after a short period this was discarded, as it was realised that the frequent changes of feed was having an adverse effect by causing scouring.

This, however, did not appear to have affected the overall trend for the season.

In this project there were a group of 33 station (North-west) bred Shorthorns. An examination of the weight movements showed that there was no difference in the trend in the gain of weight between these cattle and those from local sources.

A group of Hereford cross steers from dairy cows was also included, but again no difference in the periods when weight was gained and lost was recorded.

The rate of gain of the various sub-groups showed some differences.

For the whole period September 27, 1951, to January 15, 1953, a total of 476 days, the greatest weight increase was recorded by 40 dairy steers, from various sources, which gained 666 lb. or 1.40 lb. per day. The two actively growing periods, September 29, to December 20, 1951, and June 5,

1952 to January 15, 1953, showed gains of 174 lb. and 470 lb. respectively, or 2.1 per day during each period. The 11 Hereford dairy cross steers follow closely with 642 lb. in the 476 days, or 1.3 lb. per day. The gains during the two growing periods were 2.07 and 2.02 lb. per day respectively.

The next best performance was that of the station (North-west) bred steers with a gain of 583 lb. in the 476 days, and growing rates 1.8 lb. and 2.12 lb. for the two actively growing periods.

The lowest rate of growth is for the small group of six dairy steers from Project 1 which were kept until they were four years old. They gained 409 lb. only in the 476 days, and 1.5 and 1.44 lb. only in the two growing seasons.

The other groups of dairy steers were intermediate in their growth rates.

A study of the rate of gain shows that the group of beef strain was not clearly superior. One large group of dairy steers grew most rapidly of all, closely followed by a group of Hereford dairy cross steers, and they in turn by a group of Beef Shorthorns.

No carcase evaluations were possible.

## PROJECT 3

### Objective.

The disposal of the animals used in Project 2 enabled fresh groups to be formed to continue the study of growth trends in conformity with the basic pre-schedule. While this general study was in train, it was aimed also to continue studying the possible effect of source on trends and also, because of the inclusion of first-cross Hereford steers from dairy cows some of which were the dams of the steers in Project 1, to commence building up information comparing Hereford dairy cross steers with pure dairy steers.

### Stock.

Eighty-five steers were used of which 30 were grade A.I.S. and 20 were Hereford X.A.I.S. transferred from the Pardelup farm. The remaining 35 were Hereford cross from cull dairy cows bred on the Research Station, and included 11 from Group (F) of Project 2.

The animals transferred from Pardelup were backward in growth and light in condition.



## Seasonal.

The year 1953 in a general way followed the expected pattern. The season was not early as first germinating rains did not fall till May. June's rainfall of 10.29 inches was well above average, but was followed by below average falls and brighter weather than usual in July and August and September. At the end of September, prospects for the remainder of the year were not bright. However, good falls in October ensured an excellent finish to the spring period, both in respect to quantity of herbage and a slightly lengthened green grazing season. Conditions in November, December and January 1954, were normal.

## Grazing.

The grazing history of the groups was as follows:—From January 15, 1953 to March 12, couch flat grazing was used. From then to May 7, dry hill pasture was made available. Until August 20, all the cattle were on hill pasture, but half received a small ration of hay. This was discontinued on August 20, but all remained on the hills until September 3.

They returned to this pasture from September 23 to October 16, and from October 28 to December 17. Otherwise till January 14, 1954, the couch flats were used.

## Growth Rate and Trends.

The weights of the steers were recorded in the three sub-groups referred to above. A comparison with the feeding of hay in the autumn and winter was attempted, but discarded for reasons to be explained later.

Details of growth are as under:—

Group A was comprised of 11 Hereford dairy cross steers born on the Research Station in 1951. These were Group F Project 2. In the 12 months prior to reconstitution for this project they increased weight by 435 lb., being 1,040 lb. on February 12, 1953. By June 4, weights had declined by 71 lb. to 969 lb. They then grew continuously to January 14, 1954, achieving an average of 1,353 lb. or an increase of 384 lb. in that period. This was a gain of 1.7 lb. per day. Weight then declined to 1,331 lb. on February 11, 1954, with a slight rise to 1,339 lb. at March 11.

Group B was made up of 24 Hereford dairy cross steers born on the Research Station in 1952. Their commencing weight on February 12, was 557 lb. from which they lost an average of 21 lb. to 536 lb. by June 4. They then grew continuously to January 14, putting on to a weight of 921 lb., a gain of 385 lb. or 1.7 lb. per day. The gain was the same as in the older cattle in Group A.

Group C thirty (30) Australian Illawarra Shorthorn steers ex the Pardelup Prison Farm were brought into the trial on June 4, 1953. They were yearlings, were light in condition, and averaged 494 lb. only. They grew continuously to January 14, 1954, and increased by 453 lb. to 947 lb. in the 224 days. This is equivalent to 2.02 lb. per beast per day. Further weighings were not carried out.

Group D contained (20) Hereford A.I.S. cross steers ex Pardelup Prison Farm. As with group (b), weighing commenced on June 4, when the animals averaged 475 lb. They grew in the 224 days until January 14, 1954, 417 lb. or 1.81 lb. per beast per day.

## Supplementary Feeding with Hay.

An attempt was made to measure the effectiveness of feeding hay to a portion of the cattle. This comparison commenced on June 4, 1953, there being formed two groups, each containing 18 of Wokalup Hereford X, 10 Pardelup Hereford X and 15 Pardelup A.I.S. They were watched as closely as possible and the average weights were 536 lb. and 595 lb. respectively. The latter group were kept in a small paddock and fed 20 lb. meadow hay per day while the former were grazed in paddocks selected at the discretion of the manager. Comparisons were made for June and July only.

At the July 2 weighing, the relative weight movements were + 15.3 lb. (pasture), + 20.4 lb. (hay). At July 30 they were 46.7 lb. (pasture) and 33.7 lb. hay. An examination of the position indicated that owing to the hay group being kept in a restricted area, the quantity of pasture available quickly became very limited and the comparison then became one between free pasture and hay fed below normal requirements.



It could not be accepted as a test of supplementary feeding as the basic pastures for the two groups were dissimilar. From August 20, 1953, all the animals were run together. This attempted comparison does not invalidate the information gained on trends in the respective groups A, B, and C, as the animals were equally divided for the purpose of the supplementary feeding trial.

### Discussion.

As indicated in the objectives for this project, the accumulation of data of growth rates in conformity with the basic preschedule continued and the results showed there was no change in the trend. The cattle gained and lost weight at the same periods of the year as in the earlier projects. An attempt was made to obtain some information regarding the value of supplementary feeding with hay, but owing to inability to provide sufficient pasture for separate groups, it was quickly found that the hay-supplemented cattle became a group which was receiving hay and little pasture instead of receiving pasture supplemented with hay. For this reason, the attempt was abandoned, and the separate sub-groups were eliminated. The abandonment of the attempt to accumulate data regarding the value of a hay supplement does not affect the collection of data showing the trend of growth over the year.

As with Project 2, there was no evidence to indicate any difference in the trend according to the source of the cattle. In this project were three groups of Hereford dairy cross steers bred at Wokalup and at Pardelup and also a group of graded up A.I.S. steers bred at Pardelup. In view of the importance of the latter breed as a source of cattle for fattening in the dairying districts of the south-west, a comparison with the Hereford cross is of special value and interest. A.I.S. steers grew more rapidly than Hereford dairy cross steers from two different sources. The details are as follows:—

In the 224 days from June 4, 1953 to January 14, 1954, Group A comprised of 1951-born steers, gained 384 lb. Group B—steers of similar breeding born one year later at Wokalup, gained 385 lb. Group C, 20 of the

same cross, bred at the Pardelup Prison Farm in 1952, gained 417 lb. or 1.81 lb. per day, while the 30 A.I.S. steers (group D) bred at Pardelup gained 453 lb. or 2.02 lb. per day.

The two groups of Pardelup bred cattle grew more rapidly than those bred at Wokalup. Although the weights of the former before June 4, 1953, are not available, observation showed that they were in lighter condition than the latter, and their performance in making comparatively more rapid gains parallels the experience gained in other trials.

Group A lost 71 lb. from February 12 to June 4, while the younger Group B lost 21 lb. only. This experience has been repeated in other projects in these trials.

Project 1.  
36 HERD DAIRY STEERS—VARIOUS BREEDS AND AGES.

Date.	Weight Average.	Change of Weight since Previous Weighing.	
		Total Change.	Average per Day.
	lb.	± lb.	± lb.
30-10-50	884	....	....
16-11-50	931	+47	+2.90
19-12-50	989	+58	+2.07
1-51	978	-11	-0.31
2-51	968	-10	-0.36
3-51	970	+2	+0.07
4-51	916	-54	-1.93
15-5-51	889	-27	-0.96
12-6-51	957	+68	+2.43
7-51	1,019	+62	+2.21
8-51	1,082	+63	+2.25
4-9-51	1,098	+16	+0.57
27-9-51	1,091	-7	-0.03
10-51	1,157	+66	+2.36
11-51	1,197	+40	+1.43
20-12-51	1,237	+40	+1.43
1-52	1,226	-13	-0.46

Project 2.  
105 HEAD (MIXED).

Date.	Weight Average.	Change of Weight since Previous Weighing.	
		Total Change.	Average per Day.
	lb.	± lb.	± lb.
20-9-51	599	....	....
25-10-51	666	+67	+2.39
22-11-51	711	+45	+1.61
20-12-51	758	+47	+1.68
17-1-52	757	-1	-0.04
14-2-52	763	+6	+0.21
13-3-52	779	+16	+0.57
10-4-52	764	-15	-0.54
8-5-52	792	+28	+1.0
5-6-52	756	-36	-1.29
3-7-52	826	+66	+2.36
31-7-52	873	+47	+1.68
28-8-52	940	+67	+2.39
25-9-52	1,014	+74	+2.64
23-10-52	1,076	+62	+2.21
20-11-52	1,121	+45	+1.61
18-12-52	1,192	+71	+2.54
15-1-53	1,211	+19	+0.68
12-2-53	1,184	-27	-0.96
12-3-53	1,198	+14	+0.5



**Project 2 (Group A).  
33 STATION BRED SH. CALVED 1949.**

Date.	Weight Average.	Change of Weight since Previous Weighing.	
		Total Change.	Average per Day.
	lb.	± lb.	± lb.
27-9-51	687	.....	.....
25-10-51	754	+67	+2.39
22-11-51	797	+43	+1.54
20-12-51	839	+42	+1.50
17-1-52	838	-1	-0.04
14-2-52	835	-3	-0.11
13-3-52	858	+23	+0.82
10-4-52	834	-24	-0.86
8-5-52	888	+54	+1.93
5-6-52	794	-94	-3.36
3-7-52	888	+94	+3.36
31-7-52	936	+48	+1.71
28-8-52	1,001	+65	+2.32
25-9-52	1,077	+76	+2.71
23-10-52	1,138	+61	+2.18
20-11-52	1,186	+46	+1.64
18-12-52	1,248	+62	+2.21
15-1-53	1,270	+22	+0.79
12-2-53	1,251	-19	-0.68
12-3-53	1,268	+17	+0.61

**Project 2 (Group B).  
40 DAIRY STEERS.**

Date.	Weight Average.	Change of Weight since Previous Weighing.	
		Total Change.	Average per Day.
	lb.	± lb.	± lb.
27-9-51	584	.....	.....
25-10-51	657	+73	+2.61
22-11-51	700	+43	+1.54
20-12-51	758	+58	+2.07
17-1-52	757	-1	-0.04
14-2-52	770	+13	+0.46
13-3-52	792	+22	+0.79
10-4-52	771	-21	-0.75
8-5-52	786	+15	+0.54
5-6-52	780	-6	-0.21
3-7-52	849	+69	+2.46
31-7-52	904	+55	+1.96
28-8-52	972	+68	+2.43
25-9-52	1,047	+75	+2.68
23-10-52	1,108	+61	+2.18
20-11-52	1,164	+56	+2.0
18-12-52	1,231	+67	+2.39
15-1-53	1,250	+19	+0.68
12-2-53	1,217	-33	-1.18
12-3-53	1,228	+11	+0.39

**Project 2 (Group C).  
6 DAIRY STEERS, 1949.**

Date.	Weight Average.	Change of Weight since Previous Weighing.	
		Total Change.	Average per Day.
	lb.	± lb.	± lb.
27-9-51	819	.....	.....
25-10-51	877	+58	+2.07
22-11-51	909	+32	+1.14
20-12-51	946	+37	+1.32
17-1-52	947	+1	+0.04
14-2-52	929	-18	-0.64
13-3-52	958	+29	+1.04
10-4-52	919	+61	+2.18
8-5-52	937	+18	+0.64
5-6-52	904	-33	-1.17
3-7-52	937	+33	+1.17
31-7-52	969	+32	+1.14
28-8-52	1,017	+48	+1.71
25-9-52	1,081	+64	+2.29
23-10-52	1,126	+45	+1.61
20-11-52	1,189	+63	+2.25
18-12-52	1,210	+21	+0.75
15-1-53	1,226	+16	+0.57
12-2-53	1,202	-24	-0.86
12-3-53	1,197	-5	-0.18

**Project 2 (Group D).  
5 DAIRY STEERS, 1950.**

Date.	Weight Average.	Change of Weight since Previous Weighing.	
		Total Change.	Average per Day.
	lb.	± lb.	± lb.
27-9-51	623	.....	.....
25-10-51	688	+65	+2.32
22-11-51	724	+36	+1.29
20-12-51	755	+31	+1.11
17-1-52	746	-9	-0.32
14-2-52	755	+9	+0.32
13-3-52	798	+43	+1.54
10-4-52	753	-45	-1.61
8-5-52	775	+22	+0.79
5-6-52	751	-24	-0.86
3-7-52	789	+38	+1.36
31-7-52	844	+55	+1.96
28-8-52	894	+50	+1.79
25-9-52	978	+84	+3.0
23-10-52	1,029	+51	+1.82
20-11-52	1,082	+53	+1.89
18-12-52	1,145	+63	+2.25
15-1-53	1,159	+14	+0.5
12-2-53	1,128	-31	-1.11
12-3-53	1,150	+22	+0.79

**Project 2 (Group E).  
6 DAIRY STEERS, 1951.**

Date.	Weight Average.	Change of Weight since Previous Weighing.	
		Total Change.	Average per Day.
	lb.	± lb.	± lb.
27-9-51	289	.....	.....
25-10-51	344	+55	+1.96
22-11-51	398	+54	+1.93
20-12-51	433	+35	+1.25
17-1-52	441	+8	+0.29
14-2-52	449	+8	+0.29
13-3-52	461	+12	+0.43
10-4-52	457	-4	-0.14
8-5-52	479	+22	+0.79
5-6-52	485	+6	+0.21
3-7-52	500	+15	+0.54
31-7-52	527	+27	+0.96
28-8-52	597	+70	+2.5
25-9-52	659	+62	+2.21
23-10-52	734	+75	+2.68
20-11-52	812	+78	+2.79
18-12-52	868	+56	+2.0
15-1-53	882	+14	+0.5
12-2-53	869	-13	-0.46
12-3-53	881	+12	+0.43

**Project 2 (Group F).  
11 HEREFORD CROSS STEERS, 1951.**

Date.	Weight Average.	Change of Weight since Previous Weighing.	
		Total Change.	Average per Day.
	lb.	± lb.	± lb.
27-9-51	426	.....	.....
25-10-51	504	+78	+2.79
22-11-51	561	+57	+1.04
20-12-51	600	+39	+1.39
17-1-52	595	-5	-0.18
14-2-52	605	+10	+0.36
13-3-52	554	-51	-1.82
10-4-52	607	+53	+1.89
8-5-52	629	+22	+0.79
5-6-52	614	-15	-0.54
3-7-52	679	+65	+2.32
31-7-52	719	+40	+1.43
28-8-52	792	+73	+2.61
25-9-52	864	+72	+2.61
23-10-52	937	+73	+2.64
20-11-52	992	+55	+1.96
18-12-52	1,055	+63	+2.25
15-1-53	1,068	+13	+0.46
12-2-53	1,040	-28	-1.0
12-3-53	1,064	+24	+0.86



Project 3 (Group A (Group F of Project 2)).

11 HEREFORD CROSS STEERS BORN 1951 (WOKALUP).

Date.	Weight Average.	Change of Weight since Previous Weighing.	
		Total Change.	Average per Day.
	lb.	± lb.	± lb.
12-2-53	1,040	....	....
12-3-53	1,064	+24	+0.86
9-4-53	1,030	-34	-1.21
7-5-53	1,003	-27	-0.96
4-6-53	969	-34	-1.21
2-7-53	996	+27	+0.96
30-7-53	1,011	+15	+0.54
27-8-53	1,101	+90	+3.21
24-9-53	1,160	+59	+2.11
22-10-53	1,225	+65	+2.32
19-11-53	1,284	+59	+2.11
17-12-53	1,351	+67	+2.39
14-1-54	1,353	+2	+0.07
11-2-54	1,331	-23	-0.82
11-3-54	1,339	+8	+0.29

Project 3 (Group C).

30 A.I.S. STEERS X PARDALUP.

Date.	Weight Average.	Change of Weight since Previous Weighing.	
		Total Change.	Average per Day.
	lb.	± lb.	± lb.
4-6-53	494	....	....
2-7-53	518	+24	+0.86
30-7-53	507	+39	+1.39
27-8-53	646	+79	+2.82
24-9-53	707	+61	+2.18
22-10-53	782	+75	+2.68
19-11-53	850	+68	+2.43
17-12-53	936	+86	+3.07
14-1-54	947	+11	+0.39

Project 3 (Group B).

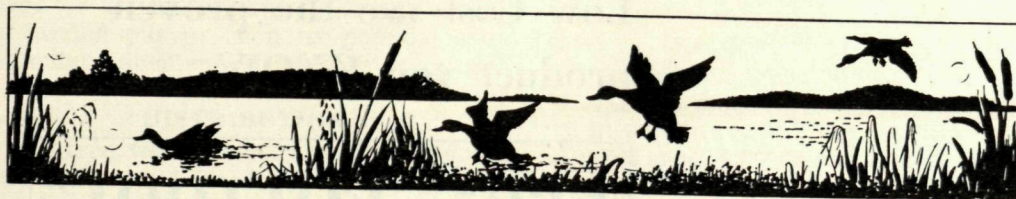
24 HEREFORD CROSS STEERS BORN 1952 (WOKALUP).

Date.	Weight Average.	Change of Weight since Previous Weighing.	
		Total Change.	Average per Day.
	lb.	± lb.	± lb.
12-2-53	557	....	....
12-3-53	580	+27	+0.82
9-4-53	590	+10	+0.36
7-5-53	572	-18	-0.64
4-6-53	536	-36	-1.28
2-7-53	543	+7	+0.25
30-7-53	578	+35	+1.25
27-8-53	660	+82	+2.94
24-9-53	715	+55	+1.96
22-10-53	781	+66	+2.36
19-11-53	850	+69	+2.46
17-12-53	912	+62	+2.21
14-1-54	921	+9	+0.32
11-2-54	904	-17	-0.61
11-3-54	938	+34	+1.21

Project 3 (Group D).

20 HEREFORD CROSS STEERS X PARDALUP.

Date.	Weight Average.	Change of Weight since Previous Weighing.	
		Total Change.	Average per Day.
	lb.	± lb.	± lb.
4-6-53	475	....	....
2-7-53	503	+28	+1.0
30-7-53	541	+38	+1.36
27-8-53	598	+57	+2.04
24-9-53	655	+57	+2.04
22-10-53	725	+70	+2.5
19-11-53	789	+64	+2.29
17-12-53	879	+90	+3.21
14-1-54	892	+13	+0.46



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