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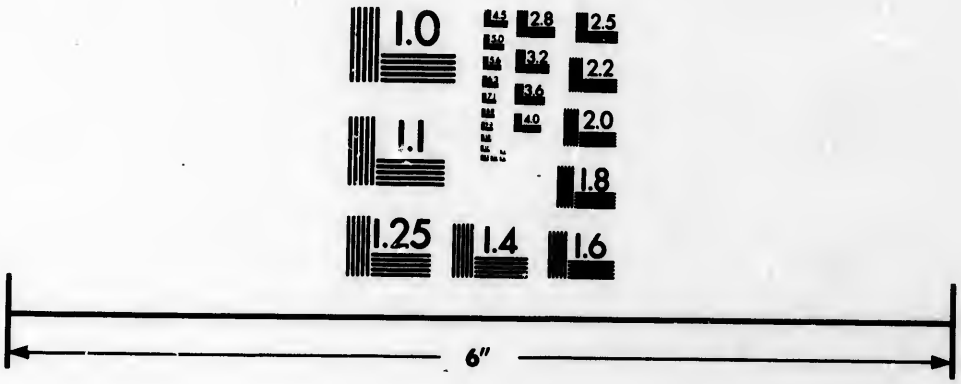

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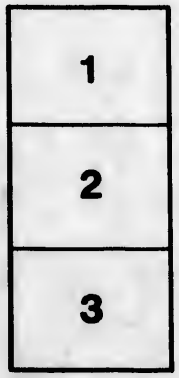

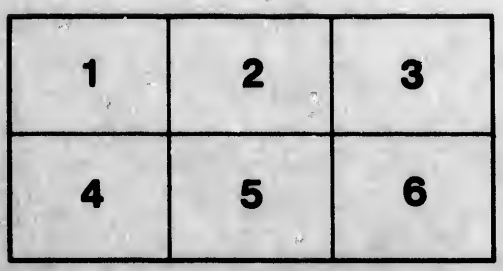

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BULLETIN LXX.

NG GRADE STEERS OF DIFFERENT BREEDS

BY THOMAS SHAW, PROFESSOR OF AGRICULTURE, AND
C. A. ZAVITZ, EXPERIMENTALIST.

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BULLETIN LXX.

DING GRADE STEERS OF DIFFERENT BREEDS

experiment consists in the rearing of grade animals of differeeds from birth to early maturity. The animals were chosen reeds whose fitness for beef production has been recognised to xtent by at least some sections of the community. The exnt commenced in the autumn of 1889 and will be completed nain features when the animals have reached the age of two The portion of it covered by this bulletin brings them only completion of their first year.

primary objects of the experiment were to ascertain:—1. The e cost of rearing grade steers, for purposes of beef production, irth until the period of early maturity, when fed upon a heavy ing ration. 2. The comparative cost of rearing grade steers ole and skim milk respectively, and the effects of these on pment after the termination of the milk period of feeding. comparative cost of producing beef from well-graded and or scrub animals respectively. The chief of the secondary were to ascertain:—1. The relative cost of rearing animals f production during different periods of growth when fed upon ration. 2. The relative daily gains; and 3. The total relacrease in weight.

he effort to secure these objects it was thought that if grade s were secured of the different breeds which to a greater or ent have been used for making beef, that the results would more valuable than if they were of the same grade. They cured therefore on this basis.

ANIMALS SELECTED. The animals secured, eight in , were obtained from leading breeders and wherever they e got of a suitable character. Each individual was the offof a pure registered sire, except in the case of the native or nd the aim was in every instance, except in that of the native, the dam a common grade cow. The effort to secure them as e birth period as possible was also fairly successful, except ase of the Galloway grade, which was fifty-three days old reached the farm. The Shorthorn grade to which was fed nilk was fourteen days old, and the others were all less than ys old. The more important particulars regarding these are given in the subjoined table. The color generally speaktypical of the breed of the sire.

Table I gives particulars regarding the breeding and th
ing characteristics of the different animals :

Grade.	Date when calved.	Sire.	Dam.	Charact of st
Galloway...	Nov. 2, 1889	Rajah of Brooke (3970).	⅛ Shorthorn and ⅞ Canadian.	Short l blocky
Shorthorn..	Dec. 22, 1889	Methlick Hero, =2723=(imp.)	A Shorthorn grade.	Rather l Shortho
Aberdeen Poll.	Jan. 1, 1890	Runnymede 2nd, 5220.	A common two-year-old heifer.	Not robu velope
Hereford...	Jan. 5, 1890	King Hal.	A good common cow.	Short l heavy
Devon	Jan. 8, 1890	Duke (947)	A Shorthorn grade.	Neatly squarel frame.
Holstein ...	Feb. 17, 1890	African Prince, (H. F. H. B.) 1270.	A common cow	Large si rather in the
Shorthorn..	April 1, 1890	Macduff.....	A Shorthorn grade.	Medium neatly frame.
Native or scrub.	April 16, 1890	A native bull of the rangey type.	A three-year-old native.	Narrow flat rib long l

FOOD AND FEEDING. Milk was fed to each of the until six months old. Of this they were given a fair allowan not all they would take. They were all given whole milk as in Table II, except one of the Shorthorn grades, which skim milk. They were fed by hand morning and evenin skim milk was warmed by heating before being fed. The fed in addition to the milk were clovery hay cut, green fodde season, and meal consisting of equal proportions by weight oats, wheat screenings and bran. None of the meal was give with the milk. During the second six months they were green food, roots and meal. The hay was similar in kind mentioned above. The green fodder consisted of oats an clover and millet, as these crops came in season. The ro prised turnips and mangels. They were not fed at the sa and were sliced before being fed. The meal during the firs months of this period consisted of peas, oats and wheat sc ground, bran and oil cake in the proportions of 4, 4, 4, parts respectively. During the next three months they re meal ration of pease and oats ground and bran, in the propor 2, 2 and 1 respectively. The meal throughout was fed dry, alo the hay, which was cut. The aim was to give each animal a same quantity of meal, but some would not take so much as

ch accounts for the difference in the amount eaten as given in the joined table. The food was given in three meals per day, and they ually had access to water at will. The animals were kept in stalls until they were about six months old. After that time were tied in stalls and were allowed to exercise about one hour y in the barnyard. The first six months will be referred to after in this bulletin, for the sake of convenience, as the first or k period, and the next six months as the second period.

OOD EATEN. It will be observed in the subjoined table that consumption of food was large, more especially with the more centrated and costly rations, as milk and meal, but this was in ping with the objects of the experiment, as already expressed. kinds of meal fed were doubtless too concentrated and costly, the quantities too large to give the best results financially.

Table II gives the consumption of food during the first and nd periods respectively:

Grades.	First six months.				Second six months.			
	Milk.	Hay.	Meal.	Green fodder.	Hay.	Meal.	Green fodder.	Roots.
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
loway..... ...	2091.5	215.5	281.5	20.0	721	1489	826	511
rthorn.....	4383.6	107.0	196.5	68.0	855	1779	615	1575
erdeen Poll	4182.2	113.0	195.5	57.0	717	1500	857	906
reford.....	4154.0	140.0	243.5	66.0	788	1754	561	1500
von	3611.4	112.0	134.5	70.5	912	1682	548	1541
stem	4475.5	110.0	190.5	125.5	884	1744	219	2377
Average (six animals).	3816.4	132.9	207.0	67.8	812.8	1658	604.3	1401.7
orthorn.....	4691.5	175.5	188.0	212.0	1059	1652	.....	3261
ub or native.....	3761.7	71.5	92 4	148.0	757	1246	.....	2898

* Fed on skim milk.

t has been already mentioned that the Galloway grade did not ch the farm until 53 days old. Prior to that time he was kled by the dam. The estimate for the consumption of whole k by this animal during that period was the average of the con- ption by all the other animals which were given this ration. It be noticed that the total consumption of milk by this calf was ll relatively. This was owing to the fact that he would not nk it regularly, but made up for the deficiency apparently in the consumption of hay and meal. The Shorthorn grade to which n milk was fed, took more of this in quantity than the average

grade consumed of whole milk, and also more of hay and roots, b little less of meal. The native or scrub consumed considerably than the average of all the food factors, except roots.

WEIGHTS. Table III gives an analysis of weights.

Grades.	Weights at end of—		Daily increase during—		
	First six months.	Second six months.	First six months.	Second six months.	First tw mont
	lb.	lb.	lb.	lb.	lb.
Galloway	457	800	2.51	1.86	2.19
Shorthorn	530	890	2.91	1.96	2.44
Aberdeen Poll	485	754	2.66	1.46	2.07
Hereford	545	900	2.99	1.93	2.47
Devon	434	803	2.38	2.01	2.20
Holstein	537	883	2.95	1.86	2.42
Average (six breeds).	498	838.3	2.73	1.85	2.30
*Shorthorn	454	848	2.49	2.16	2.32
Scrub or native	386	700	2.12	1.76	1.92

*Fed on skim milk.

NOTE. In all the figures given in Table III the weight at bi is included. It was impossible to ascertain the birth weight ow to the way in which the calves were obtained.

It will be observed that at the close of the first period, the ani to which skim milk was fed was but forty-four lb. less than average grade in weight, while he weighed sixty-eight lb. more t the native or scrub. At the end of one year he weighed 9.7 more than the average grade, and 148 lb. more than the native scrub. The latter weighed 112 lb less than the average grade at end of the first period, and 138.3 lb. less at the end of the sec period. It will also be observed that the lightest animal at the of both periods is the native or scrub.

ESTIMATED VALUE OF THE FOOD. The fodder, the grain the roots were estimated at the current market values in Guelph, the cost of marketing from an Ontario farm under average co tions, (see Bulletin LXVIII, p. 5). The home value put upon the therefore, when cut, was $5.00 per ton ; the green fodder $2.00 ton ; the oats 24½ cents per bushel ; the peas 47 cents ; the wh screenings 30 cents, and the roots when sliced 8 cents. The gr ing of the grain was put at six cents per 100 pounds. The b

oil cake reckoned as delivered at the average Ontario farm put at $12.80 and $26.66⅔ per ton respectively. The home e put upon the whole milk was 60 cents per 100 pounds. This lusion was reached by valuing the milk delivered at an average rio factory at 70 cents per 100 pounds, and allowing 10 cents 100 pounds for delivering the same. The price allowed for ing the milk may be considered a shade high for some localities. home value put upon the skim milk, the buttermilk reckoned e same rate, was 15 cents per 100 pounds. This conclusion reached by deducting the value of the butter, less the cost of ing, from the home value of the whole milk. It was estimated the average yield of butter from 100 pounds of whole milk in arm dairy is 3¾ lb., that the cost of making is 3.9 cents per d, and the average price obtained for it is 16 cents per pound. will be observed that in all probability a profit has already made on the marketable food used, providing it has been n upon the farm, as in this experiment the food was charged e full market values, less the cost of marketing from an average rio farm. This profit will be represented by the difference een the cost of growing and the market value put upon it.

ALUES. Table IV gives the financial results at the close of the period:

Grade.	Cost of— Animal at birth.	Cost of— Food.	Cost of— Attendance.	Total Cost.	Value of— Animals when six months old.	Value of— Manure.	Total value.	Gain + or Loss −
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
loway.....	2 00	11 79	2 60	16 39	25 14	1 27	26 41	+10 02
rthorn.....	2 00	28 11	2 60	32 71	29 15	1 27	30 42	− 2 29
erdeen Poll...	2 00	26 89	2 60	31 49	26 68	1 27	27 95	− 3 54
reford	2 00	27 93	2 60	32 53	29 98	1 27	31 25	− 1 28
von	2 00	23 01	2 60	27 61	23 87	1 27	25 14	- 2 47
lstein	2 00	28 66	2 60	33 26	25 51	1 27	26 78	− 6 48
verage (grade of six breeds).	2 00	24 40	2 60	29 00	26 72	1 27	27 99	− 1 01
rthorn.....	2 00	9 06	2 60	13 66	21 57	1 27	22 84	+ 9 18
ub or native ..	1 00	23 58	2 60	27 18	14 48	1 27	15 75	−11 43

*Fed on skim milk.

o conclusio ns should be drawn from this table without carefully hing all the facts contained in the bulletin.

The value put upon the animals at birth was of necessity an e mate that would be about the real value when they were dropp The cost of attendance was reckoned on the basis that one m would feed and care for 75 calves per day under ordinary conditio when the food has all been made ready.

The following was the valuation put upon the different animals the experiment, viz.:—Galloway grade, 5½ cts. per pound live weig Shorthorn grade, 5½ cts.; Aberdeen Poll grade, 5¼ cts.; Herefo grade, 5½ cts.; Holstein grade, 4¾ cts.; Shorthorn grade fed on sk milk, 4¾ cts., and native or scrub, 3¾ cts. This valuation was m at our request by Mr. James Millar and Mr. A. White, live sto dealers, Guelph. Notwithstanding that each of those gentlem estimated separately, the respective valuations made by them w in substantial agreement.

The estimated amount of manure made per animal duri the first period was 3,891½ lb. This was reckoned as wo $1.00 per ton. From the sum thus obtained the deduction w made of 903½ lb. of straw allowed for bedding, the home value which was put at $1.50 per ton. This estimate was based up actual results obtained from a test conducted simultaneously wi another calf, and mainly with the object of ascertaining the amou of manure produced by a cattle beast during different stages of growth.

The following facts stand out prominently at the close of th period, viz.:—1. The much greater cost of a whole milk ration wi adjuncts, as compared with a skim milk ration with the same. Wi the first the average cost of the food was $24.40 per animal, a with the last $9.06, or nearly two-thirds less. 2. That although the comparison just drawn there is a difference of $15.34 in the co of the food, the difference in the value of the animals at the close the periods is only $5.15. 3. The small amount of milk consum by the Galloway grade after the first 53 days reduced the cost of th ration fed to him to $11.79, or $12.61 less than the average, and the difference in the average gains per day was not very mark This would seem to indicate that a liberal whole milk ration is n an absolute necessity after the first two months of the life of th animal, and that the nature of the ration given affects the cost production more than the particular improved breed with which th animal is connected. 4. The difference in the total value of th animal fed on skim milk, as compared with the average of those f on whole milk, cost considered, is $10.19 in favor of the former a as compared with the native or scrub $20.61.

ble v gives the financial results at the end of one year.

Grades.	Cost of—			Total cost.	Value of—		Total value.	Gain + or Loss. —
	Animal at birth.	Food.	Attendance.		Animals.	Manure.		
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
way.....	2 00	27 22	5 63	34 85	44 00	6 00	50 00	+15 15
thorn.....	2 00	47 53	5 63	55 16	48 95	6 00	54 95	− 0 21
deen Poll...	2 00	43 02	5 63	50 65	39 59	6 00	45 59	− 5 06
eford.....	2 00	46 47	5 63	54 10	49 50	6 00	55 50	+ 1 40
on.....	2 00	41 62	5 63	49 25	44 17	6 00	50 17	+ 0 92
tein.....	2 00	48 53	5 63	56 16	41 94	6 00	47 94	− 8 22
verage (grades of six breeds).	2 00	42 40	5 63	50 03	44 69	6 00	50 69	+ 0 66
thorn.....	2 00	29 59	5 63	37 22	40 28	6 00	46 28	+ 9 06
b or native .	1 00	39 61	5 63	46 24	27 13	6 00	33 13	−13 11

*Fed on skim milk.

conclusions should be drawn from this table without carefully ning all the facts contained in the bulletin.

ring the second period the allowance for attendance is the same as e previous one, with the difference, that one person is supposed to for 60 animals instead of 75, as in the former period. The als were valued at the same rate per pound live weight as at lose of the milk period. The amount of the manure made per al was put at 9,996 lb. and it was reckoned at $1.25 per ton. the sum thus obtained there was deducted 2,021¾ lb. straw, d as in the former instance. This estimate was also based upon l results obtained as in the first reckoning of the manure.

will be observed that the animal fed on skim milk cost $12.81 han the average grade fed on whole milk, and $9.02 less than native or scrub, whereas he gave a net gain of $9.72 in advance e former, and of $22.17 in advance of the latter. While the e or scrub cost $3.79 less than the average grade, the net n given by him was also $17.56 less, that is to say, he cost 77 more than the former when one year old. He not only made owest gain per day, but was also rated the lowest by the valu-

CONCLUSIONS. The following are a few of the conclu that may be drawn from the experiment :

1. That we should be slow to draw conclusions as to relative value of the different improved breeds for ma beef as the food and individuality of the animal exer marked an influence.

2. That the behavior of the Galloway grade gives cou nance to the idea, that when a calf has been fed liberall the dam for about two months, a milk ration is not i pensable after that period.

3. That the average grade of the different breeds in experiment when well fed, will make a daily gain of pounds during the first year, when the weight at birth i cluded.

4. That animals without improved blood are not cap of making gains so rapidly as those of good breedin though fed with the same liberality.

5. That a young cattle beast fed on a skim milk ra with adjuncts, may be made to weigh almost as much w one year old as one of similar breeding fed on a whole ration with adjuncts similar in kind.

6. That the cost of making beef from young animal which a whole milk ration has been fed, is much gre relatively than from those to which a skim milk ration been given.

7. That while making beef from grade calves up to the of one year is highly profitable when they are fed upon a milk ration followed by a heavy meal ration, that but l profit can be obtained when they are fed upon a whole ration followed by the same.

8. That some animals are more capable of producing of a higher quality than others.

9. That it is decidedly unprofitable to attempt to p beef from native or scrub stock, even when the condi are all favorable.

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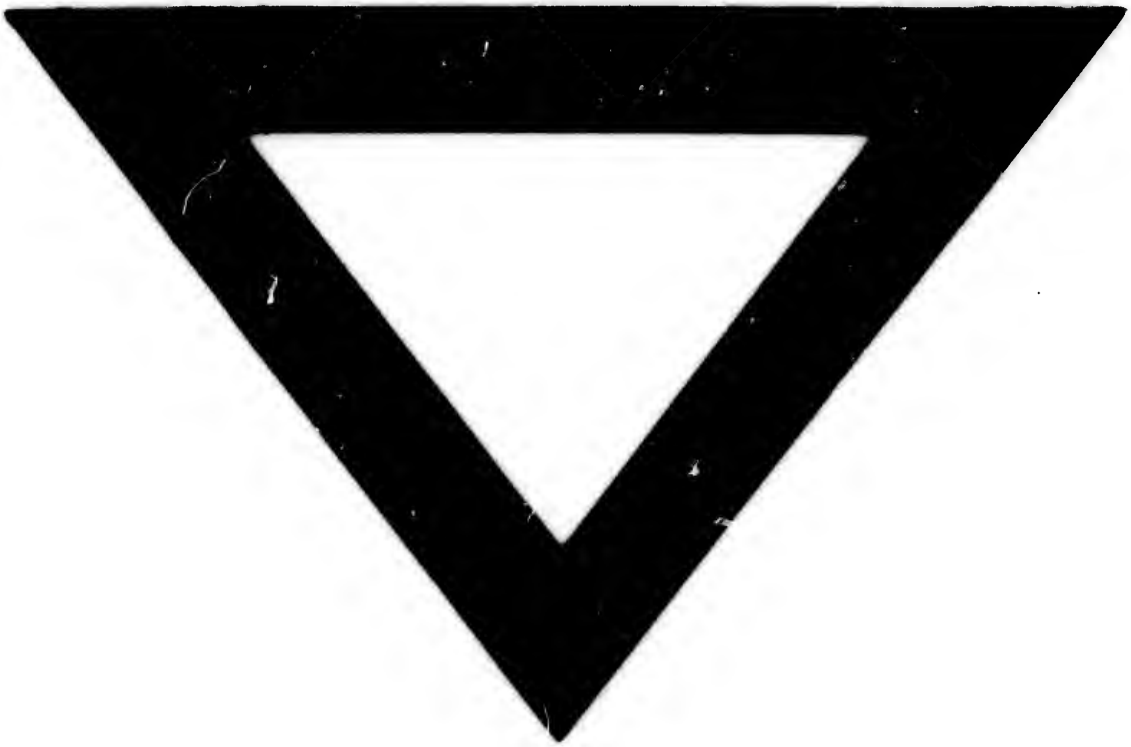
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