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Feed Consumption of Dairy Cattle During Growth

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SUMMARY

This bulletin presents rather complete data on feed consumption, and on the relation between growth and feed consumption, from birth to 2 years for Holstein, Jersey and Ayrshire cattle. These data show conclusively that the feed consumed per pound gain in live weight steadily increases with increasing age (and live weight). Thus, at 3½ months the gains in live weight per pound of digestible nutrients consumed is about 8 times as great as at the age of 2 years. It is shown that there are no breed differences in the efficiency with which dairy animals use their feed for growth. These results raise a number of questions which are discussed in the text.

ACKNOWLEDGMENT

The author is indebted to several former students for their part in collecting the data, and especially to John Falloon who as a senior and graduate student made most of the computations, R. C. Procter, Research Assistant and S. Brody, Associate Professor for assistance with a part of the tabulations and the preparations of the figures.

Feed Consumption of Dairy Cattle During Growth

A. C. RAGSDALE

Frequent inquiries from breeders of dairy cattle indicate that they are greatly interested in the amount of feed dairy animals require at various ages to make normal growth. Since 1923 the Department of Dairy Husbandry of the Missouri Agricultural Experiment Station has kept detailed records of the feed consumption of growing dairy cattle. The purpose of this bulletin is to present the averages of these feed-consumption data, and a number of ratios derived therefrom. While we now have feed records on animals from birth up to about 10 years, the data here presented cover only the period from birth to 2 years or until the approximate age of first calving. After this time variations in feed consumption due to milk production are too great to make the average values useful without including a detailed study of all factors involved. This is reserved for further study. The data on males are presented only to the age when a sufficient number of animals make the records representative.

In the feeding and management of the animals the plan has been made to keep within what is considered the limits of correct dairy practice and representative of the practices of the better dairymen and breeders. The calves were normally nursed by their mothers for the first 3 to 5 days; received mixed whole milk from the herd until the age of 4 to 5 weeks; then were gradually changed to skim milk which was continued until the age of 6-8 months. A grain mix and alfalfa hay were fed as early as the calves would eat these feeds, usually at 3 to 5 weeks. The grain mix was varied but the following is typical: 500 pounds ground corn, 250 pounds ground oats, 200 pounds wheat bran, 25 pounds linseed oil meal, 25 pounds cottonseed or gluten meal and 12½ pounds salt. Corn silage, and in some instances small amounts of soaked dried beet pulp, was also fed to a few of the animals. The general plan was to keep the animals in good growing condition. This plan of feeding is similar to the practice of the better class breeders who grow and develop their animals with reasonable rapidity. In presenting these data we do not mean to imply that the feed intake here described represents the best possible practice; the aim is rather to

report on the feed intake of animals in our herd, with the hope that it may serve as a guide to what may be termed good dairy practice. It is believed that the results are normal so far as the growth of animals is concerned.

Table 1 presents the average total feed consumption from birth to six months, 6 months to 1 year, 1 to 2 years and the totals from birth to 2 years for both females and males of the Holstein, Jersey and Ayrshire breeds.

Tables 2 to 4 (females) and 2a to 4a (males) present data from birth to 25 months showing: the number of animals included; average live weight; average daily gains in live weight; average daily consumption of each kind of feed; daily consumption of digestible crude protein and total digestible nutrients; the pounds of total digestible nutrients consumed daily per 100 pounds live weight, and total digestible nutrients consumed for one pound gain in live weight. Figure 1 represents the pounds of total digestible nutrients and digestible crude protein consumed daily from birth to 25 months by Holstein and Jersey females. Figure 2 shows the pounds of total digestible nutrients required to gain one pound of live weight from, birth to 6 months, birth to 18 months and birth to 2 years for Holstein, Jersey and Ayrshire females.

Table 5 presents data showing how individual animals of the ages from birth to 8 months vary in their gains in live weight, in total digestible nutrients consumed, and in pounds of total digestible nutrients consumed per pound gain in live weight. Similar figures are given in Table 6 for the age interval from birth to 25 months. These tables show that there are considerable individual differences in the efficiency with which animals use their feed for growth. There are however no breed differences in growth efficiency. While the Holsteins gain approximately 40 per cent more in live weight than the Jerseys during the period from birth to 8 months and 30 per cent more for the age interval birth to 25 months, yet the ratios of feed consumed to live weight gained are almost exactly the same for both breeds.

A very interesting and significant fact is that the younger animals, birth to 8 months (Table 5), required slightly less than one-half the feed nutrients for each pound gain in live weight than did the older animals, as represented by the age period from birth to 25 months (Table 6). There was also found to be a decline from 0.8 pounds of live weight gain for 1 pound of total digestible

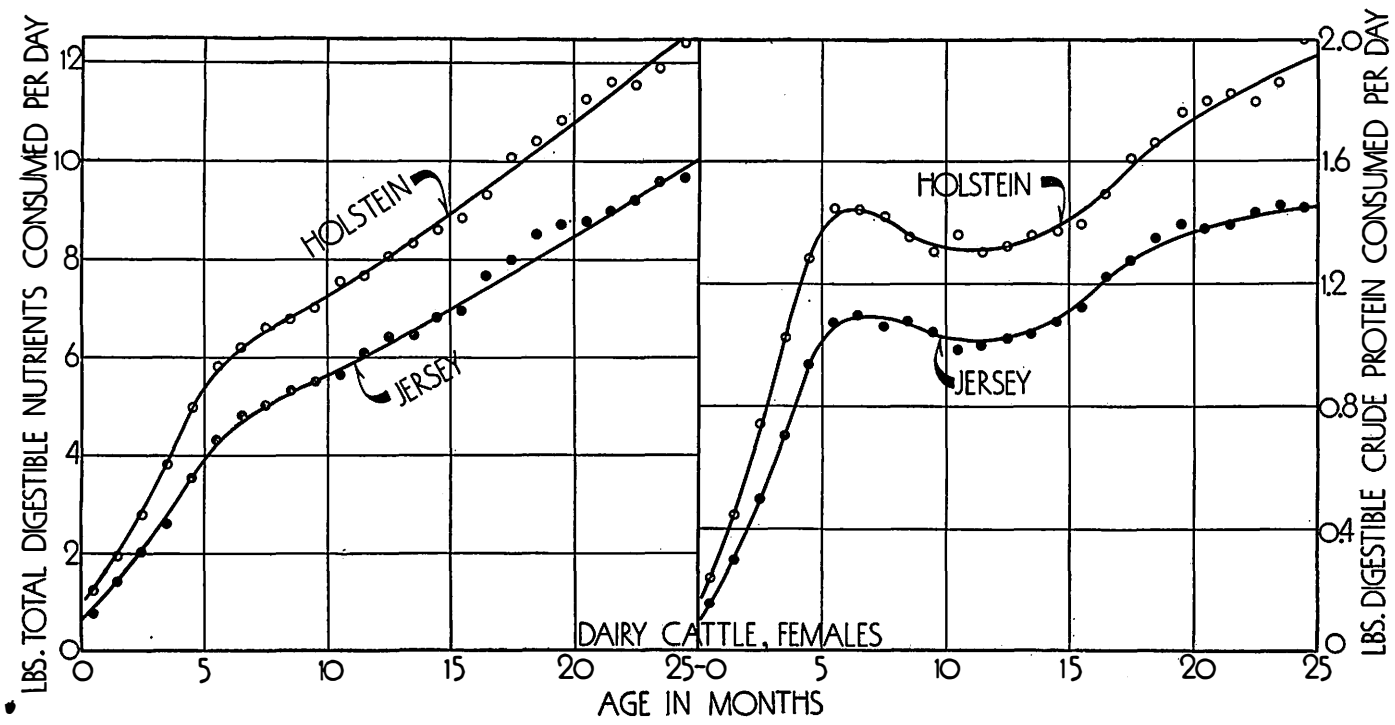


FIGURE 1.—Represents the pounds of total digestible nutrients and digestible crude protein consumed daily from birth to 25 months by Holstein and Jersey females.

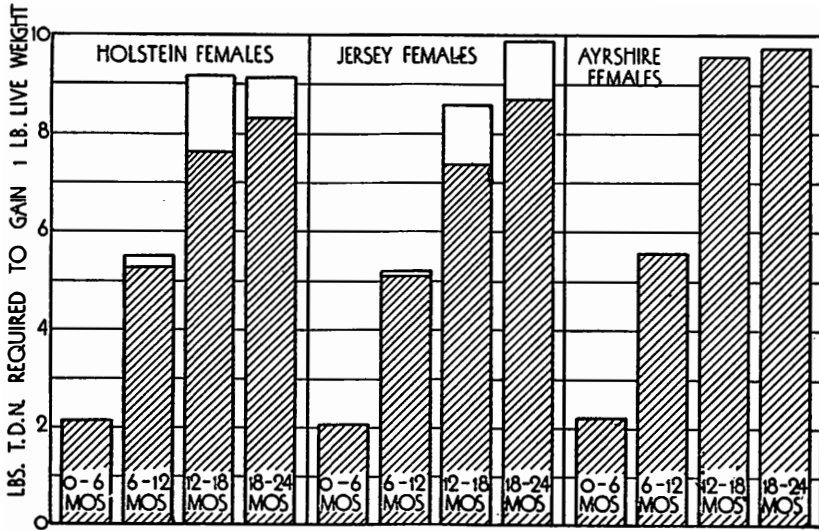


FIGURE 2.—Shows the pounds of total digestible nutrients required to gain one pound of live weight from birth to 6 months and at increased intervals of 6 months up to 2 years for Holstein, Jersey and Ayrshire females.

nutrients consumed with animals at the age of $3\frac{1}{2}$ months (average age on milk diet) to 0.1 pounds at the age of 24 months. The explanation of this decline in growth efficiency with advancing age is found in a constantly increasing diversion of feed for the maintenance of the continually increasing size of the animal's body. At the later ages this need of feed for maintenance is further increased, because more time is required to make a given gain in live weight, thus the relative cost of maintenance in comparison to gain in live weight is increased. The greater efficiency in the use of feed for growth, in the case of younger animals, suggests the desirability and economy of so feeding dairy animals that they may make approximately optimum growth at the younger ages. However, experimental data are needed to indicate whether or not rapid growth is really more or less efficient than normal or slow growth because this problem is so closely related to the influence of the rate of growth upon the length of life and total milk production.

TABLE 1.—AVERAGE TOTAL FEED CONSUMPTION OF DAIRY CATTLE FROM BIRTH TO TWO YEARS

Age Mos.	Whole Milk Lbs.		Skim Milk Lbs.		Grain Lbs.		Alfalfa Hay Lbs.		Corn Silage ¹ Lbs.	Beet Pulp Lbs.	Days Pasture
	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Holsteins											
Birth-6	439.8	423.0	2262.3	2176.8	258.6	264.3	255.3	294.6	41.4	25.2	0
6-12	0	0	1180.5	1128.3	827.4	1035.6	817.2	1031.4	350.7	130.5	--
12-24	0	0	0	0	2577.0	1626.4*	2528.0	1576.8*	2229.6	516.3*	--
Total birth to 24	439.8	423.0	3442.8	3305.1	3663.0	2926.5*	3600.5	2902.8*	2621.7	672.0*	70
Jerseys											
Birth-6	341.7	348.9	1616.4	1680.8	177.0	197.1	169.8	196.5	31.8	27.0	0
6-12	0	0	693.0	1713.9	659.7	729.6	613.5	722.4	254.4	234.9	--
12-24	0	0	0	0	2070.9	2733.9	1929.9	2609.1	1914.9	963.6	--
Total birth to 24	341.7	348.9	2309.4	3394.7	2907.6	3660.6	2713.2	3528.0	2201.1	1225.5	73
Ayrshires											
Birth-6	318.9	333.9	1863.3	1824.6	233.4	219.0	231.6	212.7	17.7	27.3	0
6-12	0	-----	368.7	-----	725.1	-----	733.8	-----	189.9	0	--
12-24	0	-----	0	-----	2003.1	-----	2600.7	-----	517.2	0	--
Total birth to 24	318.9	333.9	2232.0	1824.6	2961.6	-----	3566.1	-----	724.8	-----	54

1. Limited amounts of soaked dried beet pulp were fed to a few of the heifers. In such instances the soaked beet pulp has been added to and included under the heading "Silage".

*Grain, hay and beet pulp consumption is for periods 12 to 18 months and birth to 18 months.

TABLE 2.—AVERAGE CONSUMPTION OF FEEDING STUFFS AND OF DIGESTIBLE NUTRIENTS BY HOLSTEIN FEMALES;
ALSO LIVE WEIGHT AND POUNDS OF NUTRIENTS CONSUMED FOR GAINING ONE POUND IN LIVE WEIGHT

Age Mos.	No. of animals	Av. live wt.		Milk ¹ lbs.	Grain mix lbs.	Alfalfa hay lbs.	Corn silage ² lbs.	TDN lbs.	DCP lbs.	Lbs. of nutrients per day per 100 lbs. live wt.		Nutrients per lb. gain in live wt.	
		Lbs.	Lbs. gained per day							TDN	DCP	TDN	DCP
Birth-1	81	103	.91	7.23	.03	.03		1.26	.25	1.22	.25	1.38	.28
1- 2	87	136	1.26	11.11*	.32	.32		1.99	.46	1.46	.34	1.58	.36
2- 3	87	177	1.48	14.35	1.00	.97		2.77	.74	1.56	.42	1.87	.50
3- 4	85	225	1.70	17.29	1.71	1.71		3.83	1.03	1.70	.46	2.26	.60
4- 5	85	278	1.83	19.59	2.48	2.45		4.96	1.28	1.78	.46	2.71	.70
5- 6	86	334	1.93	20.50	3.08	3.03		5.83	1.46	1.74	.44	3.02	.75
6- 7	84	390	1.77	17.63	3.52	3.46	.76	6.21	1.44	1.59	.37	3.51	.82
7- 8	82	440	1.55	14.15	4.08	4.08	.99	6.60	1.43	1.50	.32	4.26	.92
8- 9	77	483	1.34	9.97	4.46	4.47	1.50	6.77	1.35	1.40	.28	5.05	1.01
9-10	73	521	1.17		4.90	4.87	1.76	7.05	1.31	1.35	.25	6.03	1.12
10-11	71	556	1.17		5.24	5.26	2.59	7.53	1.36	1.36	.25	6.44	1.16
11-12	63	589	1.01		5.38	5.10	4.09	7.67	1.31	1.30	.22	7.59	1.29
12-13	59	620	1.07		5.76	5.40	4.32	8.05	1.33	1.30	.21	7.52	1.24
13-14	57	652	1.06		6.06	5.67	4.84	8.33	1.35	1.28	.21	7.86	1.28
14-15	56	684	1.10		6.27	6.00	4.89	8.58	1.37	1.26	.20	7.80	1.24
15-16	51	717	1.07		6.32	6.17	5.27	8.84	1.39	1.23	.19	8.26	1.30
16-17	50	744	.73		6.71	6.64	5.10	9.35	1.50	1.26	.20	12.81	2.05
17-18	47	768	.93		7.16	7.28	5.51	10.09	1.61	1.31	.21	10.85	1.73
18-19	43	796	.89		7.36	7.53	6.24	10.42	1.66	1.31	.21	11.71	1.87
19-20	42	825	1.09		7.59	8.13	4.92	10.85	1.76	1.32	.21	9.95	1.62
20-21	41	867	1.65		8.00	8.03	6.72	11.27	1.79	1.30	.21	6.83	1.08
21-22	39	905	.92		8.20	7.71	8.45	11.62	1.82	1.28	.20	12.63	1.98
22-23	41	945	1.73		8.15	7.72	9.06	11.56	1.79	1.22	.19	6.68	1.04
23-24	37	996	1.67		8.32	7.99	9.00	11.88	1.86	1.19	.19	7.11	1.15
24-25	35	1052	2.06		8.79	8.05	9.57	12.41	2.01	1.18	.19	6.03	.98

1. Whole milk to 4th or 5th week then gradual change to skim milk with change complete about 6th week.

*Marks transition period.

2. Limited amounts of soaked dried beet pulp were fed to a part of the heifers and has been combined with and included under the silage column.

TABLE 2A.—AVERAGE CONSUMPTION OF FEEDING STUFFS AND OF DIGESTIBLE NUTRIENTS BY HOLSTEIN MALES;
ALSO LIVE WEIGHTS AND POUNDS OF NUTRIENTS CONSUMED FOR GAINING ONE POUND IN LIVE WEIGHT

Age Mos.	No. of animals	Av. live wt.		Milk ¹ lbs.	Grain mix lbs.	Alfalfa hay lbs.	Beet pulp lbs.	TDN lbs.	DCP lbs.	Lbs. of nutrients per day per 100 lbs. live wt.		Nutrients con- sumed per lb. gain in live wt.	
		Lbs.	Lbs. gained per day							TDN	DCP	TDN	DCP
Birth-1	89	108	1.05	7.69	0.05	0.05		1.32	0.27	1.22	0.25	1.26	0.25
1- 2	90	144	1.32	11.28*	0.43	0.43	0.04	2.01	0.49	1.40	0.34	1.53	0.37
2- 3	90	189	1.65	15.02	1.14	1.14	0.11	3.02	0.80	1.60	0.42	1.83	0.49
3- 4	88	242	1.94	16.89	1.97	1.93	0.16	4.11	1.07	1.70	0.44	2.12	0.55
4- 5	87	306	2.27	18.27	2.78	2.74	0.21	5.22	1.30	1.70	0.43	2.30	0.58
5- 6	77	372	2.14	17.51	3.44	3.53	0.32	6.02	1.44	1.62	0.39	2.81	0.68
6- 7	69	431	1.82	12.40	4.04	4.16	0.39	6.35	1.35	1.47	0.31	3.49	0.74
7- 8	61	485	1.77	9.91	4.59	4.70	0.48	6.87	1.38	1.42	0.29	3.88	0.78
8- 9	54	532	1.37	8.76	5.33	5.33	0.67	7.69	1.48	1.44	0.28	5.61	1.08
9-10	42	582	1.98	6.54	6.11	6.05	0.75	8.44	1.57	1.45	0.27	4.26	0.79
10-11	35	643	2.04		6.69	6.71	0.98	8.67	1.45	1.35	0.23	4.25	0.89
11-12	31	701	1.89		7.76	7.44	1.08	9.91	1.67	1.41	0.24	5.24	0.89
12-13	25	763	2.21		8.40	7.76	1.39	10.53	1.77	1.38	0.23	4.76	0.80
13-14	16	833	2.44		9.15	8.52	1.81	11.56	1.96	1.39	0.29	4.74	0.80
14-15	13	924	3.62		9.48	9.12	1.90	12.26	2.04	1.33	0.22	3.39	0.56
15-16	7	1007	1.88		8.91	8.91	4.07	12.09	1.98	1.20	0.20	6.43	1.05
16-17	3	1062	1.83		8.99	8.99	3.44	11.74	1.95	1.17	0.18	6.42	1.07
17-18	3	1133	2.86		9.29	9.26	4.60	12.68	2.07	1.12	0.18	4.43	0.72

1. Whole milk to 4th or 5th week, then gradual change to skim milk with change complete about 6th week.

*Marks transition period.

TABLE 3.—AVERAGE CONSUMPTION OF FEEDING STUFFS AND OF DIGESTIBLE NUTRIENTS BY JERSEY FEMALES;
ALSO LIVE WEIGHT AND POUNDS OF NUTRIENTS CONSUMED FOR GAINING ONE POUND IN LIVE WEIGHT

Age Mos.	No. of animals	Av. live wt.		Milk ¹ lbs.	Grain mix lbs.	Alfalfa hay lbs.	Corn silage ² lbs.	TDN lbs.	DCP lbs.	Lbs. of nutrients per day per 100 lbs. live wt.		Nutrients per lb. gain in live wt.	
		Lbs.	Lbs. gained per day							TDN	DCP	TDN	DCP
Birth-1	58	67	.59	4.78	.01	.01		.79	.16	1.19	.24	1.35	.27
1-2	62	88	.86	7.49*	.21	.20		1.43	.30	1.62	.34	1.66	.35
2-3	62	117	1.04	10.28	.69	.58		2.03	.50	1.74	.42	1.96	.48
3-4	61	151	1.26	12.69	1.04	1.03		2.63	.70	1.74	.46	2.09	.55
4-5	61	191	1.35	14.59	1.70	1.66		3.55	.94	1.86	.49	2.63	.69
5-6	63	234	1.53	15.44	2.25	2.19		4.31	1.08	1.85	.46	2.81	.70
6-7	63	277	1.37	13.35	2.76	2.71	.40	4.80	1.10	1.73	.40	3.51	.80
7-8	62	315	1.15	9.75	3.21	3.05	.39	5.01	1.06	1.59	.34	4.35	.92
8-9	62	348	1.04		3.54	3.29	1.16	5.31	1.08	1.53	.31	5.12	1.04
9-10	61	378	.97		3.80	3.50	1.57	5.49	1.04	1.45	.28	5.64	1.07
10-11	60	406	.88		4.16	3.74	2.11	5.60	.98	1.38	.24	6.37	1.11
11-12	59	434	1.00		4.52	4.16	2.95	6.08	1.02	1.40	.23	6.08	1.00
12-13	56	461	.82		4.77	4.30	3.53	6.40	1.02	1.39	.22	7.84	1.25
13-14	55	485	.78		4.86	4.28	4.25	6.43	1.04	1.32	.21	8.21	1.32
14-15	48	511	.91		5.04	4.47	4.23	6.81	1.07	1.33	.21	7.48	1.18
15-16	46	538	.91		5.19	4.77	4.08	6.92	1.13	1.29	.21	7.63	1.24
16-17	43	564	.81		5.66	5.31	4.45	7.66	1.22	1.40	.22	9.42	1.50
17-18	42	587	.73		5.76	5.62	4.70	7.98	1.28	1.36	.22	10.89	1.74
18-19	40	613	.97		6.07	5.80	5.20	8.47	1.35	1.38	.22	8.73	1.39
19-20	40	638	.73		6.17	6.07	5.14	8.70	1.39	1.36	.22	11.93	1.90
20-21	40	662	.83		6.14	5.95	5.59	8.77	1.38	1.33	.21	10.53	1.66
21-22	38	687	.86		6.34	5.71	6.58	8.97	1.39	1.31	.20	10.43	1.62
22-23	36	719	1.28		6.35	6.14	7.34	9.20	1.43	1.28	.20	7.19	1.12
23-24	37	752	.91		6.68	5.91	8.74	9.60	1.46	1.28	.19	10.54	1.60
24-25	36	782	1.07		6.68	5.91	9.38	9.65	1.45	1.24	.19	9.02	1.36

1. Whole milk to 4th or 5th week then gradual change to skimmilk with change complete about 6th week.

*Marks transition period.

2. Limited amounts of soaked dried beet pulp were fed to a part of the heifers and has been combined with and included under the silage column.

TABLE 3A.—AVERAGE CONSUMPTION OF FEEDING STUFFS AND OF DIGESTIBLE NUTRIENTS BY JERSEY MALES;
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Age Mos.	No. of animals	Av. live wt.		Milk ¹ lbs.	Grain mix lbs.	Alfalfa hay lbs.	Beet pulp lbs.	TDN lbs.	DCP lbs.	Lbs. of nutrients per day per 100 lbs. live wt.		Nutrients consumed per lb. gain in live wt.	
		Lbs.	Lbs. gained per day							TDN	DCP	TDN	DCP
Birth-1	65	71	0.58	5.02	0.01	0.01		0.83	0.17	0.17	0.24	1.44	0.29
1- 2	66	93	0.87	7.50*	0.23	0.23	0.03	1.45	0.30	1.56	0.33	1.67	0.35
2- 3	66	125	1.23	11.01	0.67	0.67	0.15	2.11	0.54	1.71	0.43	1.74	0.44
3- 4	66	166	1.51	12.83	1.27	1.27	0.18	2.93	0.78	1.77	0.47	1.94	0.52
4- 5	66	214	1.67	14.95	1.87	1.87	0.23	3.88	1.00	1.81	0.47	2.32	0.60
5- 6	65	264	1.69	16.27	2.52	2.50	0.31	4.72	1.17	1.79	0.44	2.79	0.69
6- 7	58	310	1.36	15.36	2.84	2.83	0.63	5.20	1.22	1.68	0.39	3.83	0.90
7- 8	42	354	1.53	14.63	3.30	3.25	0.78	5.64	1.28	1.59	0.36	3.69	0.84
8- 9	34	397	1.35	12.95	3.72	3.63	1.01	6.06	1.30	1.53	0.33	4.49	0.97
9-10	28	438	1.38	8.78	4.27	4.20	1.52	6.47	1.26	1.48	0.29	4.69	0.92
10-11	22	482	1.48	5.41	4.98	4.83	1.73	7.14	1.37	1.49	0.27	4.83	0.87
11-12	20	512	0.63		5.21	5.34	2.16	7.56	1.41	1.48	0.27	12.00	2.17
12-13	15	544	1.47		5.94	6.01	2.09	8.18	1.54	1.50	0.26	5.57	0.96
13-14	13	590	1.56		6.26	6.34	2.59	9.84	1.46	1.50	0.26	5.67	0.98
14-15	11	628	1.00		6.45	6.43	2.63	8.76	1.56	1.39	0.23	8.76	1.46
15-16	9	660	1.10		7.05	6.59	2.62	9.20	1.56	1.39	0.24	8.37	1.42
16-17	8	701	1.67		7.26	6.83	2.69	9.50	1.60	1.35	0.22	5.69	0.93
17-18	7	736	0.62		7.60	6.95	2.09	9.66	1.78	1.31	0.22	15.59	2.57
18-19	5	785	2.71		8.43	7.74	2.68	10.84	1.78	1.38	0.23	4.00	0.66
19-20	4	841	0.98		8.79	8.11	2.73	11.29	1.86	1.34	0.22	11.52	1.90
20-21	4	865	0.64		8.50	8.00	3.00	11.09	1.82	1.28	0.21	17.33	2.84
21-22	3	890	0.99		8.63	8.26	3.10	11.34	1.87	1.27	0.21	11.46	1.89
22-23	3	918	0.89		8.12	7.63	3.04	10.63	1.74	1.16	0.19	11.94	1.96
23-24	3	950	1.27		8.10	8.08	2.86	10.80	1.79	1.14	0.19	8.50	1.41

1. Whole milk to 4th or 5th week, then gradual change to skim milk with change complete about 6th week.

*Marks transition period.

TABLE 4.—AVERAGE CONSUMPTION OF FEEDING STUFFS AND OF DIGESTIBLE NUTRIENTS BY Ayrshire FEMALES;
ALSO LIVE WEIGHT AND POUNDS OF NUTRIENTS CONSUMED FOR GAINING ONE POUND IN LIVE WEIGHT

Age Mos.	No. of animals	Av. live wt.		Milk ¹ lbs.	Grain mix lbs.	Alfalfa hay lbs.	Corn silage ² lbs.	TDN lbs.	DCP lbs.	Lbs. of nutrients per day per 100 lbs. live wt.		Nutrients per lb. gain in live wt.	
		Lbs.	Lbs. gained per day							TDN	DCP	TDN	DCP
Birth-1	15	81	.65	5.68	.03	.03		.96	.20	1.19	.24	1.48	.30
1- 2	15	108	1.13	9.17*	.35	.34		1.66	.41	1.54	.38	1.47	.36
2- 3	15	144	1.26	12.15	1.02	1.00		2.52	.67	1.76	.47	1.99	.53
3- 4	15	183	1.38	14.13	1.48	1.48		3.21	.86	1.76	.47	2.33	.62
4- 5	15	225	1.42	15.64	2.18	2.21		4.14	1.09	1.84	.48	2.91	.77
5- 6	15	270	1.59	15.97	2.72	2.66		4.91	1.21	1.82	.45	3.09	.76
6- 7	15	312	1.21	10.06	3.22	3.23	.25	5.10	1.13	1.64	.36	4.22	.93
7- 8	15	347	1.13	2.23	3.80	3.72	.34	5.02	.97	1.45	.28	4.44	.85
8- 9	14	377	0.88		4.21	4.17	.69	5.54	1.03	1.47	.27	6.29	1.17
9-10	14	405	0.93		4.38	4.41	1.33	5.84	1.06	1.44	.26	6.28	1.14
10-11	14	435	1.07		4.17	4.30	1.40	5.75	.99	1.32	.23	5.37	.93
11-12	14	465	0.90		4.39	4.63	2.32	6.06	1.06	1.31	.23	6.74	1.17
12-13	14	494	1.07		4.84	5.42	1.47	6.67	1.19	1.35	.24	6.24	1.11
13-14	13	523	0.87		5.37	6.26	1.91	7.59	1.34	1.45	.26	8.72	1.54
14-15	13	553	1.20		5.61	6.60	1.95	7.97	1.40	1.44	.25	6.64	1.16
15-16	13	580	0.52		5.14	6.71	1.01	8.17	1.44	1.41	.25	15.72	2.76
16-17	10	601	0.94		5.80	7.04	1.18	8.21	1.47	1.37	.25	8.74	1.57
17-18	10	626	0.70		5.59	6.97	1.06	8.01	1.42	1.28	.23	11.43	2.02
18-19	9	658	1.40		5.96	7.89	1.03	8.73	1.56	1.33	.24	6.23	1.11
19-20	9	691	0.84		5.43	7.82	1.30	8.40	1.51	1.21	.22	9.95	1.79
20-21	9	715	0.72		5.40	7.83	1.42	8.34	1.49	1.17	.21	11.58	2.07
21-22	9	735	0.66		5.47	8.85	1.33	8.93	1.62	1.22	.22	13.53	2.45
22-23	9	762	1.11		5.93	8.23	1.78	9.05	1.62	1.19	.22	8.16	1.46
23-24	9	793	0.97		6.23	7.07	2.36	8.80	1.51	1.11	.19	9.07	1.56
24-25	9	820	0.84		6.10	8.04	4.43	9.63	1.63	1.17	.20	11.46	1.94

1. Whole milk to 4th or 5th week then gradual change to skim milk with change complete about 6th week.

*Marks transition period.

2. Limited amounts of soaked dried beet pulp were fed to a part of the heifers and has been combined with and included under the silage column.

TABLE 4A.—AVERAGE CONSUMPTION OF FEEDING STUFFS AND DIGESTIBLE NUTRIENTS BY AYRSHIRE MALES;
ALSO LIVE WEIGHTS AND POUNDS OF NUTRIENTS CONSUMED FOR GAINING ONE POUND IN LIVE WEIGHT

Age Mos.	No. of animals	Av. live wt.		Milk ¹ lbs.	Grain mix lbs.	Alfalfa hay lbs.	Beet pulp lbs.	TDN lbs.	DCP lbs.	Lbs. of nutrients per day per 100 lbs. live wt.		Nutrients con- sumed per lb. gain in live wt.	
		Lbs.	Lbs. gained per day							TDN	DCP	TDN	DCP
Birth-1	12	88	0.83	5.92				.99	0.20	1.12	0.22	1.19	0.24
1- 2	12	116	1.06	9.63*	0.38	0.38	0.10	1.74	0.42	1.50	0.36	1.64	0.40
2- 3	12	150	1.23	11.62	0.97	0.97	0.17	2.33	0.65	1.55	0.43	1.89	0.53
3- 4	12	191	1.50	13.67	1.36	1.36	0.17	3.00	0.81	1.57	0.43	2.00	0.54
4- 5	12	241	1.80	15.50	1.92	1.82	0.17	3.79	0.99	1.57	0.41	2.10	0.55
5- 6	12	291	1.56	15.61	2.67	2.56	0.30	4.80	1.17	1.65	0.40	3.08	0.75
6- 7	12	331	1.12	12.16	3.27	3.13	0.57	5.29	1.20	1.60	0.36	4.73	1.07
7- 8	10	367	1.26	9.40	3.65	3.53	0.81	5.58	1.23	1.52	0.34	4.43	0.98
8- 9	8	403	1.15	7.98	4.02	3.93	0.87	5.95	1.20	1.48	0.30	5.17	1.05
9-10	7	447	1.76	3.73	3.98	3.68	1.22	5.47	1.01	1.22	0.23	3.11	0.57

1. Whole milk to 4th or 5th week, then gradual change to skim milk with change complete about 6th week.

*Marks transition period.

TABLE 5.—INDIVIDUAL DIFFERENCES IN POUNDS OF TOTAL DIGESTIBLE NUTRIENTS (TDN) PER POUND OF LIVE WEIGHT GAINED FROM BIRTH TO THE END OF THE 8TH MONTH. JERSEY AND HOLSTEIN FEMALES

Jersey				Holstein			
Herd No.	Pounds weight gained	Pounds TDN consumed	Pounds TDN consumed per pound live weight gained	Herd No.	Pounds weight gained	Pounds TDN consumed	Pounds TDN consumed per pound live weight gained
862	312	791	2.5	692	465	1322	2.8
858	225	492	2.2	691	441	1099	2.5
856	325	776	2.4	690	414	1135	2.7
855	273	750	2.7	689	458	1119	2.4
854	245	686	2.8	685	393	954	2.4
953	269	780	2.9	683	450	1062	2.4
852	312	851	2.7	682	376	1010	2.7
851	288	883	3.1	681	380	998	2.6
850	341	888	2.6	680	332	905	2.7
849	318	828	2.6	678	375	911	2.4
848	246	590	2.4	677	355	968	2.7
847	288	849	2.9	675	403	995	2.5
846	304	853	2.8	673	392	1005	2.6
845	313	810	2.6	672	390	1056	2.7
844	245	560	2.3	671	405	1004	2.5
843	283	646	2.3	669	411	1081	2.6
842	280	644	2.3	668	458	1199	2.6
841	294	689	2.3	667	468	1197	2.6
840	276	727	2.6	666	426	988	2.3
839	291	698	2.4	662	420	1025	2.4
838	271	605	2.2	625	434	1081	2.5
837	275	679	2.5	615	398	1054	2.6
836	279	665	2.4	613	383	1195	3.1
835	264	622	2.4	612	393	982	2.5
834	233	640	2.7	611	392	900	2.3
833	280	590	2.1	610	418	998	2.4
831	285	719	2.5	609	405	1091	2.7
829	252	655	2.6	607	476	1031	2.7
828	195	582	3.0	606	421	856	2.0
827	259	656	2.5	605	353	960	2.7
823	272	744	2.7	604	355	936	2.6
822	271	760	2.8	603	361	863	2.4
821	289	695	2.4	602	368	827	2.2
819	292	712	2.4	601	346	818	2.3
818	331	850	2.6	600	280	769	2.7
816	294	765	2.7	599	287	852	3.0
815	251	672	2.7	597	275	850	3.1
806	263	829	3.2	594	365	941	2.6
803	254	855	3.4	593	355	958	2.7
193	258	778	3.0	592	309	865	2.8
191	265	842	3.2	591	344	933	2.7
190	239	744	3.1	590	363	951	2.6
*820	310	739	2.4	589	414	948	2.3
817	302	756	2.5	578	345	939	2.7
814	255	692	2.7	577	384	956	2.5
813	285	706	2.5	573	381	1016	2.7
812	230	739	3.2	571	343	1006	2.9
810	270	714	2.6	557	320	1119	3.5
807	266	805	3.0	553	328	1049	3.2
832	193	482	2.6	596	365	1001	2.7

*Freemartin.

TABLE 5.—INDIVIDUAL DIFFERENCES IN POUNDS OF TOTAL DIGESTIBLE NUTRIENTS (TDN) PER POUND OF LIVE WEIGHT GAINED FROM BIRTH TO THE END OF THE 8TH MONTH. JERSEY AND HOLSTEIN FEMALES

Herd No.	Jersey			Holstein			
	Pounds weight gained	Pounds TDN consumed	Pounds TDN consumed per pound live weight gained	Herd No.	Pounds weight gained	Pounds TDN consumed	Pounds TDN consumed per pound live weight gained
805	267	811	3.0	595	368	999	2.7
804	265	833	3.1	588	374	973	2.6
199	291	819	2.8	585	383	893	2.3
198	296	796	2.7	584	336	931	2.8
197	305	865	2.8	582	314	854	2.7
195	255	689	2.7	580	357	949	2.7
189	282	825	2.9	579	420	986	2.3
188	272	825	3.0	576	391	968	2.5
Ave.	275	734	2.7	575	388	905	2.3
				574	328	952	2.9
				572	330	998	3.0
				569	345	1043	3.0
				564	407	1116	2.7
				562	314	1039	3.3
				561	375	1000	2.7
				559	323	978	3.0
				556	306	1120	3.7
				552	331	1084	3.3
				Ave.	374	994	2.7

TABLE 6.—INDIVIDUAL DIFFERENCES IN POUNDS OF TOTAL DIGESTIBLE NUTRIENTS (TDN) PER POUND OF LIVE WEIGHT GAINED FROM BIRTH TO THE END OF THE 25TH MONTH. JERSEY AND HOLSTEIN FEMALES

Jersey				Holstein			
Herd No.	Pounds weight gained	Pounds TDN consumed	Pounds TDN consumed per pound live weight gained	Herd No.	Pounds weight gained	Pounds TDN consumed	Pounds TDN consumer per pound live weight gained
837	846	4775	5.6	604	1077	6120	5.7
836	764	4748	6.2	603	1124	6052	5.4
835	772	4503	5.8	602	1122	5837	5.2
834	731	4589	6.3	601	1048	5679	5.4
833	797	4505	5.7	600	958	5187	5.4
831	798	4743	6.0	599	944	5181	5.5
829	810	4620	5.7	597	872	5118	5.9
828	740	4343	5.9	594	993	5825	5.9
827	776	4369	5.6	593	1076	6194	5.8
823	718	4498	6.3	592	1034	5986	5.8
822	805	4591	5.7	591	1078	6131	5.7
821	841	4434	5.3	590	1186	6445	5.4
819	881	4721	5.4	589	994	5800	5.8
818	906	4866	5.4	578	1004	5852	5.8
816	730	4284	5.9	577	989	5773	5.8
815	733	4371	6.0	596	1118	5183	4.6
803	635	4296	6.8	588	1011	5655	5.6
*820	742	4725	6.4	584	909	5709	6.3
817	855	4448	5.2	582	980	5360	5.5
814	809	4503	5.6	580	1034	5889	5.7
813	649	4161	6.4	579	969	5876	6.1
812	792	4163	5.3	576	936	5760	6.2
810	707	4169	5.9	575	984	5628	5.7
Ave.	776	4497	5.8	Ave.	1012	5740	5.7