

*Alfalfa vs. Prairie Hay*  
*For Dairy Calves*

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## ***The Gist of It . . .***

Two feeding trials with Holstein and Jersey calves indicate that:

**Young dairy calves** may be expected to do better on alfalfa than on prairie hay of similar quality.

**When young calves** are fed a good starter they may be expected to grow about the same regardless of whether hay is fed from the time they will first eat it or if it is delayed until after the first 8 weeks of life.

**As long as the** total digestible nutrients of hay are less expensive than that of a calf starter it is possible to get more economical growth if hay is offered from birth.

**Calves that are** started in cool weather may be expected to grow more efficiently than calves that are started in hot weather.

***Dairy Calves of Today  
are Our Future Herd Replacements***

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The efficient raising of dairy replacements has always been of major importance to a sound dairy program. Two management questions, along with others, keep coming up and demanding answers wherever dairy calves are being raised:

(1) Should a young dairy calf be fed a legume or a non-legume hay?

(2) Should the young calves be fed this hay from the time they will eat it of their own accord, or should hay be withheld for the first two months of life?

It was the purpose of the two experimental feeding trials reported here to obtain answers to these questions.

## PROCEDURE

Two 16-week feeding trials were conducted, the first in the late winter and early spring of 1952, and the second during the summer of 1952. Each trial involved 4 experimental groups of 5 calves each. The Holstein and Jersey calves used were obtained from the Oklahoma A. & M. dairy herd, local dairymen, and Oklahoma institutional herds.

Each calf was removed from its dam 48 hours after birth and placed in an individual box stall. Sawdust was used for bedding. Water was provided in automatic water cups. An average of 375 pounds of fresh, warm Holstein herd milk was fed each calf over a period of 9 to 10 weeks.

\* Present address: Burrus Feed Mills, Austin, Texas.

A dry calf starter was first offered 3 days after birth. Calves were allowed to eat all they wanted of the starter up to a maximum of 4 pounds per day.

The composition of the starter, as fed to all groups of calves in both trials, was as follows:

Crimped oats	500 lbs.
Crushed corn	550 lbs.
Wheat bran	200 lbs.
Cottonseed meal	400 lbs.
Dried Skimmilk	100 lbs.
Alfalfa leaf meal	100 lbs.
Blackstrap molasses	150 lbs.
Iodized salt	10 lbs.
Steamed bone meal	20 lbs.

Alfalfa or prairie hay was fed as follows: Group I received alfalfa hay from birth; Group II received alfalfa hay after 8 weeks; Group III received prairie hay from birth; and Group IV received prairie hay after 8 weeks of age. The hay, when fed, was offered in excess of the amount the calves would clean up. Refused hay and starter were weighed daily.

Milk, starter and hay were fed twice daily (morning and evening).

The starter and hays were analyzed (Table I), and the total digestible nutrient (TDN) intake of each calf determined. Morrison's digestion coefficients were used in the TDN calculations.

Body measurements were made at weekly intervals to determine body weight, heart girth, and height at withers. A blood sample was taken every 2 weeks to follow changes in blood plasma carotene and vitamin A levels as affected by the feeding practices.

Data obtained in these feeding trials were summarized for three age intervals: 4, 10, and 16 weeks.

TABLE I.—Average Composition of Feeds.\*

Kind of feed	Dry matter (percent)	Ash (percent)	Protein (percent)	Ether extract (percent)	Crude fiber (percent)	Nitrogen free extract (percent)	Carotene (ppm.)
Calf starter	90.44	6.40	18.20	4.52	7.54	63.33	5.7
Alfalfa hay	93.76	7.11	13.43	2.06	33.39	44.01	37.4
Prairie hay	93.76	7.31	5.11	2.44	31.23	53.89	22.4

\* Averages of four analyses.

## RESULTS

### Growth

The body weight of the calves in each experimental group was essentially the same at the start of each trial (Table II). There was no real difference between the weights of the calves due to the season of the year in which they were born. At 4, 10, and 16 weeks of age, none of the calves in any of the groups showed real differences in body weights that might be associated with the treatment received. Calves in the winter trial were decidedly heavier at the end of 16 weeks than those in the summer trial. Calves fed alfalfa hay from birth, Group I, did slightly better both seasons than the calves on the other three treatments.

The heart girth of all groups of calves was essentially the same at the start of the two trials (Table II). Increase in heart girth during the first 10 weeks was greatest among the calves in Group I receiving alfalfa hay from birth. At the end of the trials all groups were about the same. This indicates that Group I calves had a temporary advantage in this respect.

Height at withers showed no real differences between groups of calves at any time during the feeding period.

### Feed Consumption and Utilization

Calves in Trial I consistently consumed more calf starter than the calves in Trial II. This was entirely a seasonal difference. There were no real differences in starter consumption from one group to another in either trial, and there were no real differences in hay consumption for any of the groups or for either trial.

In terms of the pounds of TDN required per pound of gain for the 16-week feeding period, there was a very real benefit for those calves getting alfalfa hay over those getting prairie hay. All the calves required fewer pounds of TDN per pound of gain in Trial I than in Trial II. Whether calves received hay from birth or only after they were 8 weeks of age was unimportant in terms of their efficiency of feed utilization.

Calves in Trial II consumed much more carotene than the calves in Trial I. This was due to the fact that new hay was fed to the calves on Trial II, whereas hay for Trial I calves had been stored for several months before feeding. Calves receiving alfalfa hay from birth con-

TABLE II.—Growth, Feed Consumption and Efficiency of Feed Utilization.

	Trial I (Groups)				Trial II (Groups)			
	I	II	III	IV	I	II	III	IV
<b>Avg. weight (lbs.)</b>								
Initial	80	72	64	85	67	70	81	71
16 weeks	185	189	173	170	226	194	198	219
<b>Avg. height at withers (in.)</b>								
Initial	29.8	27.7	27.5	29.7	27.9	28.1	28.4	28.1
16 weeks	35.7	34.0	34.2	33.6	34.8	34.0	34.2	33.6
<b>Avg. heart girth (in.)</b>								
Initial	30.4	28.5	28.3	30.7	29.0	30.0	30.3	29.5
16 weeks	42.4	40.0	40.0	41.4	40.6	39.6	39.4	38.4
<b>Avg. total feed consumption</b>								
Starter (lbs.)	276	269	266	291	227	232	254	234
Hay (lbs.)	157	106	126	106	249	141	201	129
TDN (lbs.)	373	338	346	355	386	328	376	321
Total carotene (mg.)	2461	2095	1379	1605	4602	2932	2780	1938
lb. TDN/lb. gain (lbs.)	2.63	2.81	2.72	2.77	3.23	2.75	4.18	3.29
<b>Avg. blood composition (mcg./100 ml.)</b>								
Plasma carotene								
4 weeks	11.3	33.1	25.1	19.8	19.2	24.1	14.3	21.0
16 weeks	77.3	113.0	98.3	176.1	174.4	117.5	116.0	130.0
Plasma vitamin A								
4 weeks	1.9	6.3	4.3	2.8	4.7	6.3	5.4	5.5
16 weeks	7.8	8.6	9.6	7.2	12.2	8.0	8.4	8.9



sume much more carotene in both trials than calves in any of the other groups.

### **Blood Plasma Carotene and Vitamin A**

The blood plasma carotene and vitamin A levels of the calves in all groups of both trials showed no real differences that could be traced to the treatments given.

### **SUMMARY**

Two feeding trials, one in winter and one in summer, were conducted with Holstein and Jersey calves to determine the comparative value of alfalfa and prairie hays when fed to calves from birth or after 8 weeks of age.

The calves fed alfalfa hay made more efficient body weight gains and required less total digestible nutrient (TDN) per pound of gain than calves fed prairie hay. Whether alfalfa or prairie hay was fed from birth or after 8 weeks of age made no difference in the efficiency of the calves in utilizing TDN for body weight gain. The calves in Trial I (winter calves) made slightly more efficient gains (required less TDN per pound of gain) than calves in Trial II (summer calves). A temporary advantage was obtained in early body development by offering hay from the time of birth in terms of larger heart girths. This advantage disappeared after 10 weeks of age.