1908

Feeding "blackstrap" molasses to young calves

Thompson Elwyn Woodward

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Agricultural Experiment Station

OF THE

Louisiana State University
and A. & M. College,

BATON ROUGE.

FEEDING

“BLACKSTRAP” MOLASSES

TO YOUNG CALVES.

T. E. WOODWARD and J. G. LEE, Jr.

BATON ROUGE:
THE DAILY STATE PUBLISHING COMPANY, STATE PRINTERS.
1908.
Louisiana State University and
A. & M. College

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INTRODUCTION.

By W. H. Dalrymple.

The primary object of this experiment, the results of which are herewith appended, was to determine whether or not low-grade sugar-cane molasses (blackstrap) could be used as a supplement to skim-milk, or, in other words, take the place of the fat that had been removed from the whole-milk, for calf-feeding purposes. In Hammond, La., and neighborhood, where this experiment was conducted, and where the whole-milk, itself, is the chief marketable product, it pays better to dispose of the milk than to use it for calf-feeding and raising. And, as commercial butter-making is not a special feature in the industry there, skim-milk is not available in sufficient quantity for this purpose, even were it practicable to use a cheap substitute for the fat removed from the whole-milk. If butter-making had been the leading feature in the dairy industry at Hammond, the skim-milk, supplemented by a substitute for the removed fat (butter), would have lessened the cost and made calf-raising by the dairymen a more profitable undertaking. Under present conditions, however, where the greatest profit is obtainable from the disposal of whole-milk, unless some complete, or almost complete, substitute can be had, the cost of raising the calf would amount to more than the worth of the calf itself.

Consequently, in order to build up the dairy herds from the local calf-crop, some cheap complete substitute for the whole-milk would have to be adopted, which is sometimes done by employing different meals and rendering the mass fluid by the addition of hay-tea, etc., and the young animals induced to consume solid food as early as possible. With an abundance of available skim-milk, substitution might be made for the fat taken from the whole-milk, by the addition of corn meal, or other material of a fat-producing character; but which would be profitable in the raising of calves, only, where butter or cream production was the chief object sought.
This question of feed-substitution has a wider application than merely to the raising of young calves, or other young animals. It applies to the feeding of all varieties of domestic animals upon the farm. A very forcible illustration of this is to be found in the case of many of the western farmers who raise timothy hay. Their experiment stations have proved to them that shredded corn fodder is equal in feeding value to their timothy. Consequently, they substitute shredded corn fodder for feeding purposes at home, from which they secure equally good results, and dispose of the timothy hay to us, and others, at most profitable prices. Did they feed the timothy hay at home, and not utilize their corn fodder, it would be equivalent to the dairyman feeding his whole-milk to his calves, when he could substitute some cheaper material for it and sell the milk on the market at a much higher figure than the substitute costs.

As may be inferred from the above remarks, he who feeds the most expensive materials is not the best nor most intelligent feeder.

The gist of our remarks might be taken to apply also in the matter of utilizing high-priced concentrated feeds for dairy cows, and feeding excessive amounts, irrespective of the requirements of the animal or animals. From records which we have seen, we are of the impression that some dairymen feed too heavily of cotton seed meal, for instance, for best results, so far as either the animal or its product is concerned. The amount in such cases might be reduced with benefit and profit, and the protein (nitrogenous) requirement made up from other, and perhaps cheaper sources.

This matter of intelligent substitution is one which every feeder of farm animals ought to very seriously consider, and try, if possible, to thoroughly understand, as it may be the means of affecting his bank account, either one way or the other, very materially at the end of the year; and this applies to dairymen with greater force, perhaps, than to any other class of livestock owners.

We desire to emphasize the fact, that although the results obtained from the use of "blackstrap" in calf-feeding were not as satisfactory as could have been hoped for, these results do not apply to molasses in the feeding of adult animals, as we have abundant evidence to show, that not only has it been fed
with most excellent results to mature stock of all kinds, but that it is our cheapest source of carbohydrates in the State. The results of this experiment proved molasses to be laxative and produced fermentation and "scours" in young calves, which, however, was not due, solely to the molasses, as such, but to the contained sugar, as pure sugar, itself, produced similar results.

Although the cause of the trouble may have been due to several factors, it is possible that the delicate mucous-membrane of the stomach and intestines of the young calf is more susceptible to irritation, or over-stimulation, produced by the sugar.

The calf-feeding experiment was ably conducted by Mr. T. E. Woodward, of the Dairy Division, National Bureau of Animal Industry, and Mr. J. G. Lee, Jr., representing the State Experiment Station.
Feeding "Blackstrap" Molasses To Young Calves.

By T. E. Woodward and J. G. Lee, Jr.

The calves used in this experiment were mostly furnished by Mr. W. W. Nott, three miles from Hammond, La., on his farm, as was also the skim-milk. The young calves were kept in individual pens 4x6. Part of the time they were allowed to run at will in a lot during the day, but were placed in their pens at night. The pens were cleaned out twice daily, and the young animals were bedded with sawdust. Kreso (a coaltar preparation) was rubbed, or sprayed, on the calves to keep them free from ticks and consequent irritation. The older calves ran out in pasture with the cows during the day, and at night were tied in their individual stalls.

Thirteen calves, in all, were fed blackstrap molasses. The young calves received from 4 to 6 pounds of skim-milk twice daily; the object being to under-feed, rather than over-feed them.

The older calves received 6 to 8 pounds of skim-milk twice daily. These would have been fed more, but for the fact that this amount was all they had previously been accustomed to.

The young calves were given all the hay and grain they would clean up; the older ones received about 2 pounds of grain daily.

The grain consisted of two parts bran, two parts corn meal, and one part oil meal. The only available roughage was oat hay and crab-grass hay.

In no instance did the molasses fail to scour the calves. The amount required to produce scours varied all the way from one-twentieth of a pound, in the case of the very young calves, to seven-tenths of a pound in the case of the seven months' old calves.
The molasses first used was slightly sour. Fresh molasses was, however, secured and heated to a temperature of 180 F., or more, but still the scouring continued. Pasteurization of the skim-milk did not have any beneficial effect. Exercise seemed to make no difference, so far as the condition of the calf’s bowels was concerned. Granulated sugar produced the same results as an equivalent amount of sugar contained in the molasses. Milk sugar proved laxative also, but about twice as much of it can be fed. Or, in other words, two ounces of milk sugar has the same effect as one ounce of cane sugar. When the calves scoured their droppings were sour-smelling; but when they did not scour, their droppings did not smell sour.

Several substances were fed along with the milk and molasses in the hope of finding something that would prevent scouring: Formalin, blood meal, and lime water proved useless. Common salt (NaCl) had a slightly beneficial effect. Fifty grains of tannin in some cases enabled us to feed about one-half more molasses than it was possible to do without it; in other cases it seemed to be without effect. All of the substances mentioned, as well as the sugar and molasses, were fed mixed in the milk.

CONCLUSIONS.

On account of its laxative effect, “blackstrap” molasses can not be used as a supplement to skim-milk for calf feeding purposes in sufficient quantity to be of any practical value.

This laxative effect is due to the sugar content, rather than to any of the other constituents of the “blackstrap.”

Scouring is caused by the fermentation of the sugar in the digestive tract.

Salt and tannin have a beneficial effect, but will not prevent scouring.
**SAMUEL—Dropped May 23.**

This calf was allowed to suck one week before we got it.

<table>
<thead>
<tr>
<th>Date</th>
<th>Milk Fed</th>
<th>Amt. left in pail</th>
<th>Substance added</th>
<th>Condition</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Whole</td>
<td>Skim</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>May 30 p.m.</td>
<td>4 lbs.</td>
<td></td>
<td></td>
<td></td>
<td>Good</td>
</tr>
<tr>
<td>31 a.m.</td>
<td>Not fed</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 p.m.</td>
<td>3.5</td>
<td>.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 p.m.</td>
<td>3.5</td>
<td>.5</td>
<td></td>
<td></td>
<td>57.5 lbs.</td>
</tr>
<tr>
<td>June 1 a.m.</td>
<td>3.5</td>
<td>.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>June 1 p.m.</td>
<td>3.5</td>
<td>.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 a.m.</td>
<td>3</td>
<td>.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 a.m.</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 a.m.</td>
<td>2.5</td>
<td>1.5</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 a.m.</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 a.m.</td>
<td>1.5</td>
<td>2.5</td>
<td>.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 a.m.</td>
<td>1.5</td>
<td>2.5</td>
<td>.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 a.m.</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>Loose</td>
<td></td>
</tr>
<tr>
<td>6 a.m.</td>
<td>1</td>
<td>3</td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 a.m.</td>
<td>1</td>
<td>3</td>
<td>2.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 a.m.</td>
<td>1</td>
<td>3</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 a.m.</td>
<td>4</td>
<td></td>
<td>1.2</td>
<td>1 oz. castor oil</td>
<td>62</td>
</tr>
<tr>
<td>8 a.m.</td>
<td>4</td>
<td></td>
<td></td>
<td>Astringent, T-spoon (3 pt. salol 1 pt. bis-subnit.)</td>
<td></td>
</tr>
<tr>
<td>9 a.m.</td>
<td>4</td>
<td></td>
<td></td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>9 a.m.</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 a.m.</td>
<td>4</td>
<td>.1</td>
<td>.1</td>
<td>Loose</td>
<td></td>
</tr>
<tr>
<td>11 a.m.</td>
<td>4</td>
<td>.1</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 a.m.</td>
<td>4</td>
<td>.2</td>
<td>.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 a.m.</td>
<td>4</td>
<td>.2</td>
<td>.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 a.m.</td>
<td>4</td>
<td>.3</td>
<td>.3</td>
<td>Better</td>
<td></td>
</tr>
<tr>
<td>15 a.m.</td>
<td>4</td>
<td>.3</td>
<td>.3</td>
<td>Loose</td>
<td>61.5</td>
</tr>
<tr>
<td>15 p.m.</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**SAMUEL—Continued.**

<table>
<thead>
<tr>
<th>Date</th>
<th>Milk Fed</th>
<th>Amt. left in pail</th>
<th>Substance added</th>
<th>Condition</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Whole</td>
<td>Skim</td>
<td>Molasses</td>
<td>Formalin</td>
<td></td>
</tr>
<tr>
<td>June 16 a.m.</td>
<td>4</td>
<td>4</td>
<td>.3</td>
<td></td>
<td>Loose</td>
</tr>
<tr>
<td>p.m.</td>
<td>4</td>
<td></td>
<td>.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 a.m.</td>
<td>4</td>
<td></td>
<td>.3</td>
<td>.5 c.c.</td>
<td>&quot;</td>
</tr>
<tr>
<td>p.m.</td>
<td>4</td>
<td></td>
<td>.3</td>
<td>.5 &quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>18 a.m.</td>
<td>4</td>
<td>3.5</td>
<td>.3</td>
<td>.5 &quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>p.m.</td>
<td>4</td>
<td></td>
<td>.3</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>19 a.m.</td>
<td>4</td>
<td></td>
<td>.3</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>p.m.</td>
<td>4</td>
<td></td>
<td>.3</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>20 a.m.</td>
<td>4</td>
<td>4.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.m.</td>
<td>4.5</td>
<td></td>
<td></td>
<td></td>
<td>Better</td>
</tr>
<tr>
<td>21 a.m.</td>
<td>4.5</td>
<td></td>
<td></td>
<td></td>
<td>&quot;</td>
</tr>
<tr>
<td>p.m.</td>
<td>4.5</td>
<td></td>
<td></td>
<td></td>
<td>&quot;</td>
</tr>
<tr>
<td>22 a.m.</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>&quot;</td>
</tr>
<tr>
<td>p.m.</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>&quot;</td>
</tr>
<tr>
<td>23 a.m.</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>&quot;</td>
</tr>
<tr>
<td>p.m.</td>
<td>5.5</td>
<td></td>
<td></td>
<td></td>
<td>&quot;</td>
</tr>
<tr>
<td>24 a.m.</td>
<td>Killed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This calf did not drink with the appetite that most calves do; it was dull and weak, thus the reason for killing it. While molasses was being fed this calf scoured; when molasses was discontinued, its condition improved. The whole milk used was from a certain cow and tested 3.7% fat. The skim milk was fed fresh from the separator after first being heated to a temperature between 95° and 100°. The molasses was old and slightly sour.
Hamm0nd—Dropped May 31.

<table>
<thead>
<tr>
<th>Date</th>
<th>Milk Whole</th>
<th>Milk Skim</th>
<th>Substance added</th>
<th>Condition</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 1 p.m.</td>
<td>1.5</td>
<td></td>
<td></td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>2 a.m.</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.m.</td>
<td>2.5</td>
<td>.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 a.m.</td>
<td>2.5</td>
<td>.5</td>
<td>1-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.m.</td>
<td>2.5</td>
<td>.5</td>
<td>1-20</td>
<td></td>
<td>45 lbs.</td>
</tr>
<tr>
<td>4 a.m.</td>
<td>2.5</td>
<td>.5</td>
<td>1-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.m.</td>
<td>2.5</td>
<td>.5</td>
<td>1-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 a.m.</td>
<td>2.5</td>
<td>.5</td>
<td>1-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.m.</td>
<td>2.5</td>
<td>.5</td>
<td>1-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 a.m.</td>
<td>2.5</td>
<td>.5</td>
<td>1-20</td>
<td>Loose</td>
<td></td>
</tr>
<tr>
<td>p.m.</td>
<td>2.5</td>
<td>.5</td>
<td>1-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 a.m.</td>
<td>.4</td>
<td>.5</td>
<td>1-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.m.</td>
<td>2.5</td>
<td>.5</td>
<td>1-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 a.m.</td>
<td>2.5</td>
<td>.5</td>
<td>1-20</td>
<td></td>
<td>48</td>
</tr>
<tr>
<td>p.m.</td>
<td>2.5</td>
<td>.5</td>
<td>1-20</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td>9 a.m.</td>
<td>2</td>
<td>1</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.m.</td>
<td>2</td>
<td>1</td>
<td>.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 a.m.</td>
<td>1.5</td>
<td>1.5</td>
<td>3-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.m.</td>
<td>1.5</td>
<td>1.5</td>
<td>3-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 a.m.</td>
<td>1</td>
<td>2</td>
<td>.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.m.</td>
<td>1</td>
<td>2</td>
<td>.2</td>
<td>Loose</td>
<td></td>
</tr>
<tr>
<td>12 a.m.</td>
<td>.5</td>
<td>2.5</td>
<td>.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.m.</td>
<td>.5</td>
<td>2.5</td>
<td>.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 a.m.</td>
<td>3</td>
<td></td>
<td>.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.m.</td>
<td>3</td>
<td></td>
<td>.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 a.m.</td>
<td>3</td>
<td></td>
<td>.2</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td>p.m.</td>
<td>3</td>
<td></td>
<td>.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 a.m.</td>
<td>3</td>
<td></td>
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<td>50 &quot;</td>
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*By mistake.
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Blood Meal did not prevent scouring, neither did salt, although it seemed to be of some benefit.

* Stove out of order.
IKE—Dropped June 7.

<table>
<thead>
<tr>
<th>Date</th>
<th>Skim Milk</th>
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*Turned out in lot during day.
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<td>&quot;</td>
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<td>&quot;</td>
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<td>&quot;</td>
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Blood Meal did not stop scouring; neither did exercise. Fresh molasses has the same effect as old molasses.
**JOE—Dropped June 14.**

From June 14 to 20 fed whole milk. June 20 and 21 fed skim milk.

<table>
<thead>
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<tr>
<td>24 a.m.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>p.m.</td>
<td>4</td>
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<td>Loose</td>
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<tr>
<td>26 a.m.</td>
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</tr>
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<td>p.m.</td>
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*Turned out in lot during day.*
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*Kept in barn.
JOE—Continued.

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This was never a very vigorous calf. Part of the time it was fed as a check on the rest of the calves. Pasteurization of milk, addition of blood meal and exercise had no noticeable effect either good or bad.
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*Kept in barn.
This was a very strong calf and was handled carefully. The change from whole to skim milk was made slowly. Up to the time sugar was added to the milk, this calf was in good condition. Tannin and salt probably had a slight tendency to stop the scouring.
MINNIE—Dropped July 10.

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57.5 lbs
MINNIE—Continued.

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*Kept in barn.
MINNIE—Continued.

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This calf was fed very carefully as a check. It scoured when getting nothing but milk.
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Note: Whole milk was unmeasurable after the July 21st calving.
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*Kept in barn.
§Better grade.

1-20 pound of molasses was sufficient to scour this calf.
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The milk was not warmed for this calf nor for any of the other older ones. Granulated sugar has a laxative effect the same as molasses. In sugar content 1-10 pound of "blackstrap" is equivalent to about one ounce sugar. 3 oz. sugar proved to be laxative, also 3-10 lb. molasses. Formalin 1 to 2700 parts milk was of no value. The addition of 50 gr. tannin enabled us to feed about twice as much molasses as before.
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**BULL—Continued.**

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.3 lbs. molasses and 3 oz. sugar proved to have the same effect. Tannin seems to have a beneficial effect. Lime water of no value. More of the milk sugar can be fed without scouring the calves than there can in case cane sugar is used.
<table>
<thead>
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<th>Substances added</th>
<th>Condition</th>
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.2 lbs. molasses and 2 oz. sugar each scoured the calf. Milk sugar not so laxative as cane sugar. Tannin has tendency to prevent scouring. Lime water valueless.
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<td>p.m. 6</td>
<td>4 &quot;</td>
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<td>8 a.m. 6</td>
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<tr>
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<td>17 a.m. 6</td>
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<td>p.m. 6</td>
<td>.6</td>
<td></td>
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<tr>
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<td>18 a.m. 6</td>
<td>.7</td>
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</tr>
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<td></td>
<td>p.m. 6</td>
<td>.7</td>
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<tr>
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<td>19 a.m. 6</td>
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SPOT—Continued.

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<td></td>
<td>.8</td>
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<td>6</td>
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<td>.8</td>
</tr>
<tr>
<td>p.m.</td>
<td>Taken</td>
<td>off experiment</td>
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7 oz. sugar produced same effect as 0.8 lbs, molasses.
### SPINGO—Dropped January 1.

<table>
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</tr>
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<td>2 &quot;</td>
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</tr>
<tr>
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<td>6</td>
<td>3 &quot;</td>
<td></td>
</tr>
<tr>
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<td>6</td>
<td>3 &quot;</td>
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</tr>
<tr>
<td>6 a.m.</td>
<td>6</td>
<td>3.5 &quot;</td>
<td></td>
</tr>
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<td>3.5 &quot;</td>
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</tr>
<tr>
<td>7 a.m.</td>
<td>6</td>
<td>4 &quot;</td>
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</tr>
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<td>4 &quot;</td>
<td></td>
</tr>
<tr>
<td>8 a.m.</td>
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<td>4.5 &quot;</td>
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</tr>
<tr>
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<td>6</td>
<td>4.5 &quot;</td>
<td></td>
</tr>
<tr>
<td>9 a.m.</td>
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</tr>
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<td>5 &quot;</td>
<td></td>
</tr>
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<td>6 &quot;</td>
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</tr>
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<td>6</td>
<td></td>
<td>.2</td>
</tr>
<tr>
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<td>.3</td>
</tr>
<tr>
<td>p.m.</td>
<td>6</td>
<td></td>
<td>.3</td>
</tr>
<tr>
<td>14 a.m.</td>
<td>6</td>
<td></td>
<td>.4</td>
</tr>
<tr>
<td>p.m.</td>
<td>6</td>
<td></td>
<td>.4</td>
</tr>
<tr>
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<td>6</td>
<td></td>
<td>.5</td>
</tr>
<tr>
<td>p.m.</td>
<td>6</td>
<td></td>
<td>.5</td>
</tr>
<tr>
<td>16 a.m.</td>
<td>6</td>
<td></td>
<td>.6</td>
</tr>
<tr>
<td>p.m.</td>
<td>6</td>
<td></td>
<td>.6</td>
</tr>
<tr>
<td>17 a.m.</td>
<td>6</td>
<td></td>
<td>.7</td>
</tr>
<tr>
<td>p.m.</td>
<td>6</td>
<td></td>
<td>.7</td>
</tr>
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<td>18 a.m.</td>
<td>6</td>
<td></td>
<td>.7</td>
</tr>
<tr>
<td>p.m.</td>
<td>6</td>
<td></td>
<td>.7</td>
</tr>
<tr>
<td>19 a.m.</td>
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<td>.7</td>
<td>50 gr.</td>
</tr>
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<td>6</td>
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<td>50 &quot;</td>
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<td>6</td>
<td>.8</td>
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</tr>
<tr>
<td>p.m.</td>
<td>6</td>
<td>.8</td>
<td>50 &quot;</td>
</tr>
<tr>
<td>21 a.m.</td>
<td>6</td>
<td>.8</td>
<td>50 &quot;</td>
</tr>
<tr>
<td>p.m.</td>
<td>Taken off experiment</td>
<td></td>
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</tbody>
</table>

6 oz. sugar produced same effect as 0.7 lbs. molasses.

All milk was fed sweet and clean, and in the case of the young calves it was heated to a temperature between 95 and 100 degrees Foh. The feeding pails were sunned daily and the separator was scalded out every morning.
MILK SUBSTITUTE

FOR

CALF FEEDING

The following letter explains itself:

Hammond, La., April 20, 1908.

Dr. W. H. Dalrymple, Baton Rouge, La.

Dear Sir:—In compliance with your request I have visited the farm of Mr. J. A. Caston and obtained his method of raising calves on a milk substitute. It is as follows:

The calves are taken from their dams a day or two after birth and taught to drink from a pail. They are then given five to eight pounds of their mother’s milk twice a day until the milk is fit for human use, which of course will vary with the different cows, but on the average Mr. Caston begins saving the milk on the fifth day after calving. The milk is then reduced until at the end of ten days the calf is receiving one pint of milk twice a day, and this amount of milk is fed until the calf is six weeks of age, when the milk is discontinued entirely. At the same time that the milk is being reduced, bean soup, shorts, blood meal and sometimes cottonseed meal are added to the calf’s ration until at the end of ten days it is receiving twice daily, in addition to its pint of milk, bean soup from 4 oz. of navy beans, 3 oz. shorts, 1 oz. blood meal and probably about half the time 3 oz. of cottonseed meal. The calf receives this ration until it is six weeks of age, when the milk is discontinued and the same amount of the substitute fed as before until the calf is four months old, when it is weaned; that is, put on dry feed entirely. The calf is encouraged to eat hay as soon as it will. Mr. Caston prefers
alfalfa to any other kind of hay, and peavine hay is his second choice. The calves run in an open lot and they have access to grass whenever there is any.

Mr. Caston thinks that failure in raising calves on bean soup is due more to the method in which the soup is prepared than to any other cause. Following is the method which he has found to be very successful: Parboil the beans in soda, then drain off the water and boil again until soft. Squeeze through a colander and add salt until the soup has a decidedly brackish taste. Stir in the shorts, blood meal and cottonseed meal and add luke-warm water until each calf receives about three quarts of the mixture. Of course the amounts to be given will vary with different calves. The above figures are the average for strong grade Holstein calves. The cost of the milk substitute is between 4 and 5 cents per day.

Very respectfully yours,

T. E. Woodward.