

The Influence of Overfeeding on the Dairy Cow

The Only Marked Effect is That She Puts on More Flesh

TO what extent does under feeding or over feeding influence the composition of milk? The question is an important one, but with the exception of two experiments reported to have been conducted some years ago in Europe, definite data has not been secured upon the subject until recently. Prof. Eckles, of the Missouri station, has, in conjunction with the federal authorities, been at work on the problem, and some important results have already been obtained. Regarding under feeding the experiments are not yet complete, and nothing definite has been announced except that this has a much greater influence on the composition and properties of milk and its components than has over feeding. On the effects of over feeding, however, definite information has been secured and published. This information is not confined to the effect on the quality of the milk, but includes as well the effect of over feeding on the milk flow of the animals and on their body weight.

Over Feeding and Milk Production.

With one cow the feed given was only slightly in excess of the normal amount required for maintaining the body and producing milk. No effect whatever was exerted on the milk production, in spite of the fact that the previous feeding had been below the normal amount required. On another animal which had been milking 75 days, and whose milk flow had been appreciably reduced by previous under feeding, the effect of over feeding to the extent of 40 to 45 per cent. was only to restore the milk flow to normal. In the case of a cow whose lactation period had begun when she was nearly 200 lbs. under weight, and was therefore in very poor condition, the effect of imposing upon her a rapidly increasing ration was to quickly restore her to normal weight, though no accompanying increase in the milk flow resulted.

The only case in which super-normal feeding had the direct effect of increasing the milk flow was that of a cow which was five months advanced in her lactation period when over feeding was induced. Previous to this she had been fed a normal ration, but owing to advancing lactation the flow had decreased by about one-third. "The first effect of the increased feed," says the experimenters, "was to raise the production almost five pounds a day. This eventually fell off, but was maintained for two months at an average of about two pounds a day above the flow with which the experimental period was begun, and in spite of the fact that the end of the lactation period was approaching, when the normal condition should have been a gradual decrease in the flow. . . . The effect of the high plane of nutrition was to overcome the normal influence of advancing lactation. . . . The actual amount of solids produced in excess of the normal was small compared with the solid matter stored in the cow's body during the same period. The increased milk solids amounted to only 11 lbs. during the whole period, while during the same time the cow stored about 80 lbs. of solid matter in her body."

The results of the experiment as far as milk production is concerned, are summed up by the experimenters as follows: "In regard to

the influence of over feeding on the milk flow, one is impressed with the limited extent to which the animals use the excess food for the production of milk. Even under the most favorable circumstances, the animals seem unable to increase their milk flow beyond the fixed stimulus for this function inherent in the individual. Over feeding will sometimes cause a recovery of the milk flow lost because of poor nutrition, but this recovery is only partial under the best conditions. A very high plane of nutrition would appear from these experiments to be effective in holding off a decline in milk flow naturally resulting from ad-

vanced lactation. It probably would not be economical from the standpoint of milk production to stimulate secretion in this manner, but the results are interesting as an explanation in part of the remarkable success that has been attained in holding up the milk production when it is the purpose to obtain the highest possible yearly record. The results of these experiments also serve to give a clearer conception of the problem of feeding. A high class dairy cow is one born with a strong stimulation to secrete milk; and the general problem in feeding is to supply the cow sufficient nutrients to support the milk production she has inherited."

Fat Only Slightly Affected.

The percentage of fat in the milk was only affected by the overfeeding indirectly as a result of the increased milk flow. Where this had previous to the test been reduced by under nutrition, the percentage of fat had been above normal. "Our data," say the experimenters, "seems to warrant the conclusion that normal milk and butter is to be expected when the cow is on a super-normal plane of nutrition, as well as when the plane of nutrition is normal, provided there are no other influencing factors, such as specific feeds."

Sediment Test Unreliable

"Clean" Milk May Be Unsanitary

THE sediment test has been largely used for the hygienic analysis of milk. By it a certain quantity, say a pint, of milk is run through a cotton disk by which means the visible

dirt is extracted. This shows up plainly on the white cotton. The practice largely followed has been to cut the disk in two, forwarding one-half to the patron who supplied the milk and retaining the other half for reference purposes. It thus served as a valuable object lesson in cleanliness, and the introduction of its use generally resulted in an improvement in the milk in this regard.

The value of the sediment test, aside from the matter of cleanliness, is based on the assumption that the number of bacteria found in the milk bear some relation to the amount of dirt contained in it. It is assumed that the particles of dirt act as carriers of bacteria, that the amount of dirt found in the milk can be taken as a general indication of the sanitary conditions under which it is produced, and that it therefore is an indication of the number of bacteria that the milk



Greatly interested in an editor of Farm and Dairy and his camera. Those who have had experience of animal photography will appreciate the difficulty of getting such a line-up as this. Snapped in a pasture field near Madoc Junction, Hastings Co., Ont.

contains. For these reasons the sediment test has gained favor with inspectors and makers as furnishing a simple method by which the hygienic quality of the milk can be determined.

With the object of determining the value of the sediment test in detecting unsanitary milk, A. C. Campbell, of the United States Bureau of Animal Industry, recently conducted some experiments. Fifty samples of milk were collected at a railway station platform from milk cans as they arrived from dairy farmers in the neighborhood. At the laboratory a bacterial count was made of each sample, after which a sediment test was conducted of a representative sample from each can. The sediment disks were kept and compared with the bacterial count. The following table shows the results as found by the gravity sediment test, the four classifications of the sediment referring to the character and quantity of the sediment found:

Sample No.	Bacteria per c. c.	Character of sediment	Sample No.	Bacteria per c. c.	Character of sediment
1.....	2,000,000	Fair	6.....	1,500,000	Fair
2.....	1,812,000	Medium	7.....	100,000	Bad
3.....	1,587,000	Good	8.....	260,000	Bad
4.....	100,000	Bad	9.....	1,303,000	Fair
5.....	640,000	Medium	10.....	219,000	Medium

This table shows that sample three, testing good for sediment, had a bacterial count of 1,537,000 per c. c., while sample seven, classified as bad for sediment, had a count of only 108,000.

To determine the effect that straining would have on the test, some of the samples were filtered through different materials, such as cheese cloth (four thicknesses), absorbent cotton and Canton flannel. These samples were tested similarly to the unfiltered samples. The following table shows the results of milk filtered through four thicknesses of cheese cloth:



Cotton discs showing the various amounts of dirt in milk as revealed by the sediment test.