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### THE ADULTERATION OF CATTLE FEEDS

#### A Law Needed That Will Require the Sellers of Feeds to Show Their Composition

SOME at least of the mill feeds, that are being sold in large quantities are adulterated, and otherwise inferior in quality. This was shown last week by Prof. R. Harcourt, of the Ontario Agricultural College, Guelph, Ont., in an address delivered at the annual convention, held in Brantford, of the Western Ontario Dairymen's Association. Farm and Dairy has been asked to look into this matter by leading dairy farmers who have felt that the cattle feeds they were purchasing at high prices were adulterated. At the convention of the Eastern Ontario Dairymen's Association, held recently in Prescott, Ont., Mr. P. Clarke, proprietor of the Silver Spring Dairy Farm, Deschene, Que., informed us that as a result of information he had received from another leading dairy farmer he had discontinued feeding bran to his cattle and their milk yield had increased.

Professor Harcourt told the convention at Brantford, that not only is there a wide variation in the composition of the same kind, of by-products of the mills, but that there is a tendency to mix residues of one grain with another and sell them under a trade name. In some cases low-grade by-products are added to those with which the farmer is familiar. For instance, oat hulls are sometimes added to wheat bran. This makes it impossible for the purchaser to form a correct idea of the composition or value of a food from its name.

Professor Harcourt advocated the taking of steps to have concentrated feeds sold in such a manner that the percentage composition rather than their name will be the guide to their value.

He pointed out that laws have been passed in many states of the American Union making it compulsory for the seller of mill by-products to print on the bag the guaranteed maximum percentage of protein and fat and the minimum percentage of crude fibre and also, the grains from which the feed was made. In this way the buyers are able to know exactly what they are buying. While much that Professor Harcourt said was rather technical his remarks were followed closely by the farmers present. At the close of his address a request was made that it should be published so that the facts might be laid before farmers at large.

#### CATTLE FEEDING

"The study of the science of cattle feeding," said Professor Harcourt, "has received a great deal of attention during late years. Fortunately, while a knowledge of the results of the numerous investigations would be of great aid to the thorough understanding of the subject, it is not essential to success; for the practice of some experienced feeders leaves little to be desired. They have learned much from their forefathers, and this, together with long experience with the same

kind of cattle and feeding stuffs, and the natural instincts of a feeder, has enabled them to become proficient in the art of feeding. There are, however, many farmers, both old and young, who have not been bequeathed any valuable experience, and, further, there are on the market today a great variety of new cattle foods about which very little is known. Consequently there are many reasons why we should look into the question of the composition of some of the cattle foods.

#### COMPOSITION OF FOODS

The feeding value of a food is largely determined by two factors: (1) Its composition, (2) its digestibility. The first of these deals with richness of the food in protein, fat, carbohydrates, and ash materials. The second determines the extent to which these various constituents become available in the body. A knowledge of the composition of a food is important if it is to be used intelligently. Those foods which contain the largest amounts of the protein and fat and the smaller percentage of crude fibre are the most valuable. The following table gives the percentage amount of the various food constituents present in a number of the most common foods:

#### COMPOSITION OF CATTLE FOODS

	Water	Crude Protein	Fat	Soluble Carbohydrates	Crude Fibre	Ash
Wheat.....	10.5	11.9	2.1	71.9	1.8	1.5
Oats.....	11.0	11.8	5.0	56.7	9.5	3.0
Barley.....	10.9	12.4	1.8	63.0	2.7	1.8
Corn.....	10.6	10.3	5.0	70.4	2.2	1.5
Peas.....	14.0	22.5	1.6	53.7	5.4	2.8
Timothy Hay.....	13.2	5.9	2.5	4.90	29.0	4.4
Clover Hay.....	15.3	12.3	3.3	38.1	24.8	6.2
Alfalfa Hay.....	8.4	14.3	3.2	48.7	25.6	7.4
Oat Straw.....	9.2	4.0	2.3	42.4	57.0	5.1
Corn Silage.....	79.1	1.7	0.8	11.1	6.0	1.4
Mangels.....	90.9	1.4	0.2	5.5	0.9	1.1
Turnips.....	90.5	1.1	0.2	6.2	1.2	0.8
Wheat Middlings.....	10.1	15.5	3.9	62.5	4.3	3.7
Wheat Bran.....	10.4	15.0	3.8	57.0	8.7	3.1
Cotton Seed Meal.....	5.9	44.2	13.0	24.6	4.8	6.9
Linsed Meal.....	9.1	33.4	7.1	30.9	10.6	5.9
Gluten Meal.....	7.1	38.8	3.4	47.6	2.0	1.1
Gluten Feed.....	8.6	25.0	4.6	54.8	5.9	1.1
Brewer's Grains.....	9.5	14.6	8.5	36.1	12.8	1.3
Oat Hulls.....	8.1	2.2	0.9	33.9	24.1	6.8
Dried Beet Pulp.....	2.9	3.5	1.1	63.9	15.2	6.4

#### FORAGE PLANTS

"The valuable forage plants of this country belong mostly to two families, the grasses and the legumes. June grass, red top, timothy, and the cereal grain plants are types of the former; and the clovers, alfalfa, and peas of the latter. The most essential difference between the members of the two families of plants when considered as feeding stuffs is in the larger proportion of the protein in the legumes. For this reason they are very justly regarded as the better foods for growing stock and for general use on dairy farms.

"The composition of all dried fodders and roots,

foods that are fed in an immature state, is liable to considerable variation. The composition depends largely on the stage of maturity at which they are cut and also upon the character of the manuring. In general it may be said that as a plant matures the proportion of water, protein, and ash matter decreases, while the proportion of carbohydrates, especially of fibrous material, increases. As this latter substance is largely indigestible, fodder crops deteriorate towards maturity.

"Young grass is much richer in albuminoids and contains a smaller proportion of indigestible fibre than older grass, and is, consequently, more nourishing. The same comparison may be made between young clover and that which is allowed to mature for hay. It follows that fodder crops should be cut for hay before they reach maturity, and experimental work and general experience has fully demonstrated that these crops should be cut immediately after full bloom is reached. Alfalfa is an exception to this, because it very rapidly becomes fibrous and should be cut in the early blossoming stage to obtain the best results.

"Fodder crops deteriorate towards maturity, because of the conversion of soluble forms of carbohydrates into the insoluble and indigestible fibre. Root crops, such as mangels and potatoes, improve, owing to the carbohydrates produced in this case being sugar and starch, both of which are of great feeding value.

"The root crops do not contain a very large amount of the valuable food constituents, but when fed along with the dried fodders, they probably have a food value much greater than their composition indicates. This is due to the increased succulency which they impart to the ration.

#### WHY GRAIN IS FED

"The place of grain in a ration is to increase the proportion of protein and other digestible materials, or in other words, to make the ration more concentrated. Cows of 1,000 lbs. weight need approximately 16 lbs. of total nutrients daily. Animals that are thin in flesh, especially when fresh in milk, can consume two or three pounds more to advantage. Of these 16 lbs., approximately 2.5 lbs. of protein is necessary, in order to enable the cow to produce large and continuous yields of milk.

"If a cow is fed all day, she cannot eat enough of the food to obtain the amount of the nutrients mentioned. Thus, suppose a cow should be fed all she can consume of any palatable, dry, coarse fodder, such as good hay, she would have at her disposal the following digestible nutrients, approximately: Protein 1.4 lbs.; fat 0.4 lbs.; carbohydrates 12.4; total 14.2. Such a ration lacks in protein, as well as in total digestible matter.

"In order to overcome these deficiencies, recourse is had to the concentrated feeds, rich in protein, and sufficient is added to increase the protein to the desired amount. This is the function of grains and concentrated by-products of the ra-