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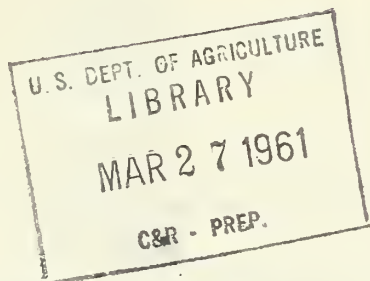
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LIVESTOCK FEEDING AND THE FEED INDUSTRY IN BELGIUM*

POTENTIALS OF FEED UTILIZATION

To make clear the possibilities of livestock feeding in Belgium, there is presented the following approximate survey of Belgian livestock numbers :

	<i>January 1, 1957</i>	<i>January 1, 1958</i>
Horses (agricultural) ...	177,515	174,108
Cattle :	2,299,906	2,413,396
less than 1 year ...	690,850	725,357
between 1 and 2 years ...	479,244	521,116
Swine ...	1,370,357	1,318,977
Poultry :		
Laying hens ...		16,000,000
Broilers ...		30,000,000
Sheep ...	130,717	108,034
Goats ...	34,143	33,969

*This is a report by Dr. G. Van Snick, Chief-Inspector-Director, Animal Production Service, Ministry of Agriculture, Brussels, Belgium, Dr. Emile P. Cordiez, Professor, School for Veterinary Medicine of Coreghem, Coreghem, Belgium, and Mr. Lode Van den Heuvel, Manager, Feed Division, Boerenbond Belge, Merksem (Antwerp) Belgium. It was presented at the International Animal Feed Symposium sponsored by the U.S. Department of Agriculture and the Soybean Council of America, Inc., in Washington, D.C., May 4-6, 1959. The Foreign Agricultural Service is reproducing this and other Symposium reports as an aid to those interested in animal feeding and feed utilization.

For Belgium these data mean an animal production (in thousand francs—year 1956) :

Cattle	...	18,712,500
For milk	...	10,982,400
For meat	...	7,730,100
Swine	...	5,912,800
Poultry	...	5,509,800
Horses	...	247,200
Sheep	...	75,300
		<hr/>
Total		30,457,600

The value of the animal production amounts to 77 percent of the value of the total agricultural production, excluding horticultural production.

The production of mixed feeds in Belgium, 1953 to 1958 has been estimated as follows (in metric tons) :

	1953	1954	1955	1956	1957	1958
Feedstuffs for :						
Cattle	259,990	321,648	319,592	345,586	338,178	329,742
Poultry	211,892	245,038	275,242	337,242	366,970	438,820
Swine	210,486	259,944	286,220	339,198	432,996	396,236
Horses	13,500	12,680	11,984	9,714	8,696	8,760
Total	<hr/> 695,868	<hr/> 839,310	<hr/> 893,038	<hr/> 1,031,740	<hr/> 1,146,840	<hr/> 1,173,558

Since 1953, the production and consumption in Belgium of mixed feeds are increasing constantly, reflecting an intensification of animal production. Towards 1953, the production of feeds was estimated roughly to be $\frac{1}{3}$ for cattle, $\frac{1}{3}$ for swine, and $\frac{1}{3}$ for poultry. This equal distribution among the three major livestock divisions in Belgium no longer exists, and the divergence is likely to continue steadily in coming years.

The slight increase of mixed feeds for *cattle*, notwithstanding the rise in livestock numbers and in the production per animal, has many causes :

- (1) A major program for expansion of fodder production promoted by the Ministry of Agriculture which has produced tangible results, has allowed the farmers to stock a larger amount of raw fodders—hay and silage—for the winter, and to spare a part of the concentrate feeds, cereals and mixed feeds.

- (2) The relation between the price of concentrates and the price of milk does not always favor an extensive use of mixed feedings. However, the dairy farms that are situated near the large centers, and thus can sell directly to the consumer, always use large quantities of concentrates to advantage.
- (3) The production from cattle is still essentially a family operation and has not been affected by mechanization as much as in the case of swine and poultry.

The middle rate of concentrates (cereals, cakes and mixed feeds) fed per dairy cow and per lactation period, may be estimated at approximately 500 kg.

The production of beef shows a sufficient propensity towards "baby-beef", thus justifying the use of larger quantities of concentrate feeds.

As to the feeding of the beef calf and of the breeding calf, there is already a sufficient use of milk replacers.

Just as in other countries, the feeding efficiency in the case of dairy cattle and of beef cattle has increased slightly but the progress is yet far from spectacular.

For production of *swine*, the use of mixed feeds has increased noticeably. The reasons of such evolution are :

- (1) The progress in the quality and the efficiency of commercial feeds, as for instance, a feeding efficiency of 3 to 3.5 kg. of feed per kg. of weight increase is no longer uncommon.
- (2) A beginning of mechanization in swine production (integration).

Undoubtedly, it is in the poultry industry that technical progress in feeding has been most evident.

Laying per hen has increased as follows :

Before 1914	...	...	...	80 eggs
1936-38	...	...	...	120 „
1947-48	...	...	...	130 „
1949-52	...	...	...	140 „
1953	...	...	...	145 „
1954	...	...	...	155 „
1955	...	...	...	160 „
1956	...	...	...	165 „
1957	...	...	...	170 „
1958	...	...	...	175 „

In the specialized industry average production ranges from 190 to 210 eggs per hen.

Factors tending to increase still further the efficiency of these concerns include :

- (1) The rise in average production ;
- (2) The lowering of mortality rate ;
- (3) The use of feedstuffs which are richer in energy and protein and supplemented with additives.

As in other countries, the "broiler" concerns have developed prodigiously.

At present, the consumption of industrially produced chickens may be estimated as 5.1 kg. per head per year.

To show the results obtained in the manufacturing of animal feeds, it is enough to indicate that the amount of feeds necessary to produce an increase of 1 kg. varies from 2.7 to 3 kg. Great progress probably will be made in the coming years.

The tendency shown during the last 5 years toward an ever larger use of mixed feedstuffs will continue in coming years. We consider that the development in the manufacturing of mixed feedstuffs will go on, especially for poultry, swine, and the fattening feeds of young cattle, and to a lesser extent, for dairy cattle feeds.

EVOLUTION OF THE MARKET

Expenditures by Belgian agriculture during 1957 totaled 27.3 billion francs.

The portion representing the cost of feed amounts to 8.2 billion francs, or 30 percent, distributed as follows :

			<i>Quantity</i> <i>Metric tons</i>	<i>Price</i> <i>Francs per ton</i>	<i>Total value</i> <i>1,000 francs</i>
	Imports				
Rye	...	...	60,000	3,142	188,520
Barley	...	...	560,000	3,166	1,772,960
Oats	...	...	120,000	2,971	356,520
Other cereals (sorghum, buckwheat, millet)	...	...	180,000	3,237	582,660
Cakes	...	...	150,000	4,751	712,650
Beet	...	...	10,000	284	2,840

		<i>Quantity</i> <i>Metric tons</i>	<i>Price</i> <i>Francs per ton</i>	<i>Total value</i> <i>1,000 francs</i>
Hay	... ..	3,000	1,673	5,019
Straw	... ..	—	—	—
Pulps (dry)	... ..	90,000	3,765	338,040
Molasses	... ..	45,000	1,650	74,250
Brans	... ..	82,000	2,831	232,142
Malts (dry)	... ..	27,000	4,000	108,000
Concentrates	... ..	31,000	9,240	286,440
Lucerne and)	90% ...	31,500	4,483	141,215
grassmeal)	10% ...	3,500	4,702	16,457
Total, Belgium-Luxembourg		<u>—</u>	<u>—</u>	<u>1,201,563</u>
Subtracted for imports of Luxembourg—		<u>—</u>	<u>—</u>	<u>—412,280</u>
Total, Belgium		<u>—</u>	<u>—</u>	<u>789,283</u>
		<i>Metric tons</i>	<i>Francs per ton</i>	<i>1,000 francs</i>
Domestically produced				
secondary products				
Brans—				
Of home-grown grains		165,000	2,631	467,115
Of imported grains ...		90,000	2,831	254,790
Total ...		<u>255,000</u>		<u>721,905</u>
Cakes—				
Of home-grown grains		10,000	4,711	47,110
Of imported grains ...		125,000	4,711	593,875
Total ...		<u>135,000</u>		<u>640,985</u>
Pulps (fresh)		1,485,000	120	178,200
Malts (fresh)		240,000	600	144,000
Molasses		99,000	1,650	163,350
Total ...		<u>—</u>	<u>—</u>	<u>1,848,440</u>
Home-grown feeds				
Rye		27,502	2,900	79,756
Winter barley		36,745	2,887	106,083
Spring barley		36,535	2,934	107,194
Oats		106,184	2,703	187,015
Beet		446,180	247	110,206
Clovers		24,876	1,577	39,229
Hay (grassland)		79,607	1,138	90,593
Straw		350,000	493	172,550
Total ...		<u>—</u>	<u>—</u>	<u>892,626</u>

The coccidiostats without sulfonamide bases may be incorporated with the feeds provided that a preliminary agreement of the Minister of Agriculture has been obtained.

The Departmental Order of June 11, provides for the utilization of antibiotics. Four antibiotics are approved : penicillin, aureomycin, terramycin and bacitracin. The maximum allowed amount reaches 20 grams per ton of feed. The use of antibiotics is limited to the feeding and fattening of poultry, of swine and to the breeding and fattening of calves. Simultaneous utilization of several antibiotics is allowed, provided that the total amount of 20 grams per ton of mixed feed is complied with ; namely, for simultaneous utilization of antibiotics and sulfonamide coccidiostats.

The list of antibiotics and of sulfonamide coccidiostats may be changed and perfected only on decision of the high committee for public health.

As will be seen, the restrictive terms as to the manufacturing of animal foods are numerous. The law aims to ban the utilization of substances of questionable value and effectiveness.

The labels on the container of feeds containing antibiotics and coccidiostats must indicate :

- (1) The percentage of total minimum amount ;
- (2) The date of manufacturing ;
- (3) The limitative date of warrant for the antibiotics and the sulfonamide coccidiostats ;
- (4) The number of the agreement.

Bills of sale and similar documents referring to the product have to mention the number of the agreement.

When a manufacturer wants to refer to the presence in the feeds of useful vitamins, diastases, amino acids and ferments, or to their specific action, he has to request the agreement of the Department of Agriculture. In case of indication of the presence of vitamins, the label has to mention :

- (1) For each vitamin referred to, the warranted minimum amount in international units, or otherwise, in "conventional units" or in "milligrams" per gram for the vitamin concentrates and per kilogram for the other substances ;
- (2) The date of manufacturing ;
- (3) The limitative date of warrant for the vitamins ;
- (4) The number of agreement.

TECHNOLOGICAL ADVANCES IN LIVESTOCK FEEDING

The evolution in unit-production during the past years gives a true picture of the improvements in the feeding of domestic animals. It is not possible to make a systematic study of the progress within this domain.

As to the energy feeds, the allowed rations are more concentrated in order to bring them to a level with the increasing requirements in keeping with the genetic improvement of the breeds. This result has been obtained, in case of cattle, by the production of ever better animal feeds and by more effective supplementation with concentrates.

Energy enrichment has been more spectacular in the case of pig feeding and particularly in the case of poultry, following a revision of the components of the feeds and the use of a percentage of animal or vegetable fats.

Protein feeding has been improved quantitatively and qualitatively. The energy protein balance has been observed attentively in the case of poultry. The needs in amino acids have been ensured by using a sufficiently varied amount of vegetable protein supplements and amino acids such as methionine.

If the energy and protein part represents, from an economic point of view, the most important fraction, the other ingredients—minerals and vitamins—engaged the attention of the farmer and of the feeding industry, as for instance in the still growing utilization of mineral concentrates adapted to the nature and the composition of the components of the raw rations of the cattle.

Finally, concerning vitamins, the deficiencies are seldom seen as a result of the adding of vitamin A and carotene to the feeds of all livestock and of a complement of some vitamin B to the rations for pigs and poultry.

The broad application of scientific advances has improved the health and productivity of Belgian domestic animals.

TECHNOLOGICAL ADVANCES IN FEED MANUFACTURING

From the above mentioned data of the mixed feed production emerges the fact that there is an active evolution in feed manufacturing in Belgium. As a result of eager demand for mixed feed and increasing rise of microconstituents, most manufacturers are compelled to renovate and extend their plants. The following points are mentioned particularly :

I. Automation : Automation is of first importance for taking delivery or for unloading of raw materials. These are mostly shipped and unloaded by means of mechanical or pneumatic systems. Weighing machines are used to check the delivered quantities and to control the output of the plant. Automation

is necessary also in the milling process. The milling is mostly done in oat mills. But the Belgian feed manufacturer uses also milling plants operating cylinder mills, owing to the importance attached to the graining and refining of the products.

Ingredients application and the mixing process need automation also. The "batch" method and the unbroken line method are in use for mixing ; different combinations of both methods have been created.

For bagging and forwarding the manufactured products automation has been applied in most cases.

2. **Application and mixing plants :** The great diversity in the physical and chemical properties of the constituents of feed and also, the still growing utilization of microingredients have compelled most feed manufacturers to concentrate on the application and mixing system. In the case of the application and mixing of liquid (molasses and fats) special attention is given to perfect dispersion of such products in the feed.

3. **Feed manufacturing in a pressed form :** The making of feed in pressed form is expanding. The mixed concentrates for bovines are in pressed form generally ; however, the use of mixed feed in pressed form is also expanding for poultry and even for swine.

4. **Forwarding of the manufactured products :** In Belgium, most of the feeds are forwarded in bags (50 kg.). Burlap bags as well as paper bags are in use. There is some forwarding of feed in "bulk" form ; however, no real expansion is foreseen, as in Belgium there are numerous little composite farming operations which are not suitable at present for automation of the feed system.

"Bulk" handling can be justified only if the farmer installs an automatic feed system.

In conclusion, the rapid technical advances started in feed manufacturing are still in evolution. Automation is applied in feed manufacturing. In the future years, it will increase a good deal more.

