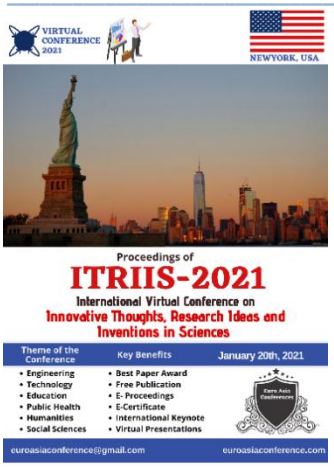


# ROLE OF SUGAR PRODUCTION WASTE IN INCREASING THE PRODUCTIVITY OF CATTLE

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## Annotation:

In the production of sugar, a number of production by-products arise, which are used in feeding cattle. Production waste in the form of fresh and dry pulp, molasses and molded pulp contain valuable substances in the form of cellulose, hemicellulose, pectin, crude protein and protein.

## Key words:

Sugar, sugar beet, beet mass (pulp), molasses, ensiling, crude protein.

Sugar production produces a variety of by-products that are used in feeding cattle. According to the production technology, sugar beets are washed, crushed and subjected to diffusion (washing out sugar and dissolving it in water). This solution is heated to 73-78 ° C. The raw juice containing sugar is separated from the crushed beet pulp (pulp), the main by-product of sugar production. Raw juice is purified from sediment using limestone and carbon dioxide. The purified juice contains about 12-15 % of dry matter and is evaporated to obtain a thick syrup. Then sugar crystallizes from this syrup. The remainder of the syrup from which the sugar was obtained is molasses, another valuable product in livestock feeding. About 35 kg of sugar, 540 kg of raw pulp and 40 kg of molasses are obtained from a ton of sugar beet.

Sugar beet shavings, after the sugar has been extracted from them, leave the production in a liquid state, with a water content of about 90% and at a temperature of about 70 ° C. Some of the water is removed by squeezing. So get raw pulp with a dry matter content of 20 to 30 % and at a temperature of about 50 ° C. This product is fed to animals fresh or ensiled.

Fresh beet pulp should be fed in 1-3 days to prevent spoilage.

During transportation, pulp, especially in large quantities, cools slightly, so it is very important to silage it directly from the transport, without intermediate storage. This avoids loss of nutritional value, contamination, and also stimulates the process of "hot fermentation".

Pulp is low in protein, high in energy and has an average crude fiber content (see table 1). The basis of crude fiber is cellulose and pectin, which are very important for ensuring

normal operation of the scar. Pulp is a very valuable feed for lactating cows as it provides energy to the rumen but does not contain starch. The diet of these feed raw materials includes from 2 to 6 kg of dry matter per head per day.

Table 1. Nutritional value of sugar by-products from sugar beet

| Indicator Raw | Raw pulp | Dry pulp | Molasses pulp | Molasses |
|---|---|---|---|---|
| Dry matter, g / kg | 200,00 | 906,00 | 900,00 | 773,00 |
| Crude ash, g / kg DM | 60,00 | 55,19 | 80,00 | 97,02 |
| Crude protein, g / kg DM | 115,00 | 97,13 | 120,00 | 126,78 |
| Crude fiber, g / kg DM | 205,00 | 198,68 | 183,33 | 0 |
| Sugar, g / kg DM | 17,00 | 52,98 | 177,78 | 623,54 |
| Crude fat g / kg DM | 12,00 | 6,62 | 8,89 | 0 |
| Net energy of lactation, MJ / kg | 7,49 | 7,49 | 7,64 | 7,73 |
| Exchange energy, MJ / kg DM | 12,02 | 11,99 | 12,15 | 12,11 |
| Assimilated protein (nXP), g /kg | 159,30 | 155,34 | 162,42 | 158,41 |
| Rumen nitrogen balance, g / kg | -7,10 | -9,32 | -6,79 | -5,06 |
| Calcium, g / kg DM | 10,00 | 9,71 | 9,78 | 6,47 |
| Phosphorus, g / kg DM | 1,50 | 1,10 | 0,89 | 0,39 |
| Sodium, g / kg DM | 2,75 | 2,41 | 1,89 | 12,03 |
| Magnesium, g / kg DM | 4,50 | 2,52 | 2,53 | 0,26 |
| Potassium, g / kg DM | 7,00 | 13,25 | 10,00 | 59,51 |

Another by-product of sugar production from sugar beet. In a sugar factory, pulp is mixed with molasses and then dried. After drying, the mass is granulated, usually through a 12 mm diameter die (coarse granule). Molasses pulp contains even more energy than dry pulp. Depending on the amount of molasses introduced, the sugar content in the final product is between 13 and 28%. The rumen degradation of this feed is uniform, due to which it is well absorbed by animals.

The molded pulp is well suited for feeding replacement young stock on grazing, in an amount of 1.5 to 3 kg per head per day. It is included in the diet of dairy cows in the amount of 2-4 kg. For businesses that harvest a lot of grass silage, this feed is a good energy supplement to the protein-rich staple feed.

Molded pulp is a standard component for the production of feed for dairy cows.

Molasses is a by-product of sugar production. It is a dark brown or black syrup. The dry matter content of molasses is 70-75 %, the sugar content is about 50%. Sugar is responsible for the high energy content of this raw material. To improve the fluidity of molasses, water is added to it, then the dry matter content is reduced. In practice, molasses with a dry matter content of less than 50 % is often found, which, of course, reduces the amount of energy in this raw material

Therefore, it makes sense to check the molasses for dry matter content. Molasses contains no crude fiber and has about 10-12 % crude protein. Molasses is widely used in feeding; it significantly improves the taste of the diet. It is often fed in combination with straw. Dairy cows receive no more than 1-2 kg per day due to the high sugar content. Almost all industrial feed for cattle includes molasses in the amount of 5 to 10 %. By-products of

sugar beet processing are high-energy raw materials with a low crude protein content and a pronounced negative nitrogen balance in the rumen (from -4 to -9 g N / kg DM). This raw material is rich in calcium and potassium, which means that it is not applicable in feeding dry cows (with the exception of molasses in special cases). Sugar by-products are an interesting feedstock for livestock. Pulp in various forms supplies cheap and highly valuable energy in the form of cellulose, hemicellulose and pectin. These foods are slowly digested in the rumen and are gentle on rumen microorganisms. The use of these products is recommended primarily in diets with protein-rich staple foods.

Also, in feeding low-productive cows (for example, in the 3rd lactation period), cereals can be completely replaced with pulp. Beetroot products vary greatly from manufacturer to manufacturer. Therefore, in each specific case, it is important to research these products for the content of dry matter, sugar and other nutrients.

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