

ALTERNATIVE FEED MATERIALS

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- 1. Milk by-products can be dried to produce protein-rich and energy-rich raw materials (such as dried whey)
- 2. Single cell proteins (yeast, bacteria, probiotics) produced by biotechnological methods
- 3. Poultry products produced by hydrolysis and rendering systems slaughterhouse by-products
- 4. Some feeds that are not evaluated and exported (such as locust bean)
- 5. Fruit and vegetable processing residues or by-products (such as citrus fruits, apples and tomatoes) may be dried to form raw material that some animals can join in their mixed feed.

TAPIOCA (MANIOOC)

- Tapioca is a tropical root plant.
- It has a body with a length of 2-3 m, a root of 5-15 cm in diameter and a length of 30-40 cm.
- The hecter yields 10-30 tons.
- At late harvest, the cellulose ratio increases and the starch ratio decreases in the roots.
- New harvested tapioca roots contain 65% water, 25% starch, 2% CF, 3% CP.
- The roots are pelleted to 2-3 cm in size after harvesting, dried for 2-3 days under the sun, dried and reduced in transport volume and protected from dust.

- Tapioca antinutritional factors: Linamarin, lotustralin. They are enzymatically and chemically released into cyanic acid (HCN).
- - If the roots are dried in the form of chips in the sun for two weeks or if they are heated at 150 ° C, this acid will decompose.
- Some of the oxalic acid (0.1-3%) found in the roots is lost during processing and storage.
- In tapioca flour: DM 88%, CP 2.6%, CFS 5%, NfE 77%, ME 3050 kcal / kg.
- Tapioca broiler rations 20%
- 15-25% in egg hens,
- 20% in milk cows,
- fattening cattle and lamb rations can be used up to 50%.

TOPINAMBUR (Jerusalem artichoke, *Helianthus tuberosus* L.)

- Localization is perennial and summer
- The ovaries are resistant to winter and dry pudding (potatoes are affected from the oven).
- Fresh grass, hay and silage from the green area
- Nutritious ingredients are equivalent to potatoes.
- Storing the end of harvest for a long time and in a high temperature leads to the loss of nutrients.

- Leaves in KM 20-28% CP
- - It has a positive effect on egg yield in chickens.
- Leafy eyes are a good bait for rabbits.
- -Your dry calves are close to good meadow dry matter in terms of nutritional values.

1- Topinambur tuber

- Eggs grow in autumn and winter.
- No alkaloids have been reported in herbaceous plant.
- Tubers; DM 18%
- dry matter CP 11%
- CF 6%, ash 9.6%
- ME 3060 kcal / kg.

- Alcohol, sugar syrup and pure fructose preparations are made from topinambur tubers.
- The total amount of carbohydrate in the tubers is 12-16%. An important part of the carbohydrate fractions is inulin.
- in Tuber
- ascorbic acid, 40 mg / kg
- vitamin B1, 1.4 mg / kg
- vitamin B2, 0.4 mg / kg
- niacin is 1 mg / kg.
- Vitamin E 15 mg / kg DM
- (3-3.5 mg / kg in the row material).
- Mineral matter quantities are in DM
- Ca and P 1 -3 g / kg, Mg 0.66 g / kg, Na 3.83 g / kg,
- K 16.5-19.7 g / kg and Cl 1.9 g / kg.



Topinambur tubers

- is consumed with appetite and is very well digested.
- Ruminants can be given up to 10-15 kg per day as potatoes.
- Horses should be eaten after thoroughly cleansed. The wingers love to eat their ovaries.
- Rabbits also consume locusts and especially leaf parts.
- The local club has gained a distinct importance as a FOS source, which has begun to take place in the feeding of single middles in recent years.

Hiding of tubers

Artificial drying is a good way.

Natural drying can be done with sun and wind.

Eggs can also be stored by silage.

Topinambur green

- The locale is planted for tuber and green.
- At the end of June, the July head shape is leafy and the locality is a good source of green flour. two forms can be made.
- Dried locale is a source of good green protein and energy (12.85 MJ / kg ME). The amount of carotene is 175 mg / kg.
- In carded individuals, CP falls to 5-8% from 25-28% and CF is higher (30%).
- Half of the coarse swallow must consist of the green of the locale.

- The silage of the greenery is done as if it is in the sunflower green and is more delicious.
- Silage dry matter contains 10% CP.
- Ruminants can be given up to 25 kg after the exercise period and are consumed with love.
- In addition to eating calves (4-6 months) hay and concentrate, 3 kg of topinambur green silage can be given.

CHICKEN faeces

- From egg hen 45 kg of feces are obtained at 45 weeks of production, 4.3 kg at 8 weeks from broiler chickens and 15 kg at 15 weeks of age.
- EE 2%, CHO 35-40% (cellulose, pentose and lignin)
- In the chickens, other substances in the environment such as stools + incontinence pads, spilled foods, crustless or broken eggs, feathers, dust are added.
- The organic part of the chicken feces contains uric acid, NH₃ salts, urea, keratin, creatinine, traces of amino acids, gut cells, bile salts, pigments, hormones, vitamins and some other compounds.

- The total amount of nitrogen is 3-6% (18-36% CP) in dried chicken ovary (DCO/KTD).
- There is a very high level of vitamin B12 in the stool (500 mg / kg).
- There are some hazards that can be caused by pathogenic bacteria, viruses, fungi, parasites and feed additives, hormones, mineral substances, medicinal remedies and even bedding materials feeding on dried chicken ovary.
- Some Salmonella serotypes such as Salmonella pullorum and Salmonella typhimurium were isolated from E. coli fresh chicken broth.

- Energetically rich grains can be used with root feed, molasses or fruit pulps.
- KTD is 15-30% for fattening cattle feed. 20% of birds
- up to 15% can be added to broiler finishing feeds.
- **PROHIBITED USE OF KTD AS FEED IN THE FEED-LAW!**

RUMEN CONTENT

- An average of 35-50 kg tripe content is found in the cows that have been culled (BW 7% 7-10%).
- There is 12% CP, 2% EE, 8.8% ash and 36% CF in the dry matter content (20%) of the pressed rumen content.
- Each kg of rumen contains 35-55 g of bacteria and protozoan, High B12 and K vitamins.
- The pressed rumen content is between 13 and 18% lignin. This value is 11% in meadow grass.
- **PROHIBITED USE OF KTD AS FEED IN THE FEED-LAW!!**

- ÜRE hayvanlara tedricen artırılarak verilir.
- Üre:
 - NH₂
 - C=O
 - NH₂
- Rasyona üre katıldığında Na₂SO₄ gibi S kaynakları kullanılmalı, rasyonda S/N oranı 1/12-15 olacak şekilde kükürt ilavesi yapılmalıdır.
- Genç sığırlarda kaba ve konsantre yem arasında 1:2.5, yaşlılarda ise 1/1.5-2 şeklinde bir denge kurulabilir.
- Ancak bazı durumlarda %80-90'lara varan düzeyde konsantre yem uygulaması ile karşı karşıya kalınıyor.

CORNCOB

- Production in our country is 500.000 tons.
- The content of the nutrient content of the cob was 90.5%
- CP 3.1%, CF 36.4%, NOS 50.97%.
- Rat silage can be done.

PAMUK TOHUMU

- Pamuk iplikçiğinden (linter) ayrılan bütün pamuk tohumları işlenmemiş ve değeri düşürülmemiş yağlı tohumlardır.
- PT, yağ kaynağı olarak yüksek verimli süt ineklerinin beslenmesinde kullanılır.
- Linteri alınmış pamuk tohumları bütün haldeki pamuk tohumlarına göre daha fazla protein, yağ ve enerji bulundururken, daha az iplikçik içerir.

COTTON SEED

- All cotton seeds separated from cotton yarn (linter) are untreated and unqualified oil seeds.
- PT is used as feed oil for feeding high yield milk cows.
- Linseed cotton seeds contain fewer strands, while more protein, fat and energy are present than cotton seeds.

- It can take up to 25-30% of the dry matter content in the region.
- If cotton seeds are present in excess of 15% in total, consideration should be given to subclinical symptoms of gossypol poisoning or the reproductive system.
- Cotton seeds should be examined for aflatoxin contamination.

- Cotton seed
- 88% DM, 21% CP, 18% CF, 18.7% EEY and 4.5% ash.
- Cottonseed and crustacean seeds are high in cellulose and encourage chewing and ruminating, so some of the roughage can take place.
- If 20% fat is present in the crustacean seeds, the ration oil level should be well adjusted. Poisoning with Gossipol is given to remove the riskiest from the center.

SUNFLOWER SEEDS

- 20% CP, 44% EE, 16.5% ADF,
- 0.63 Mcal NEL / kg, 0.26% Ca, 0.67% P.
- Some varieties were 23.5% CP, 25% EE, 28.5% ADF,
- 0.44 Mcal NEL / kg, 0.30% Ca, 0.60% P, and the like.
- It is used at 0.7-2 kg per cow per day, DM or 3-7% at full range (TMR).
- Sunflower seeds can be given without processing.
- It is best not to be given alone.

WHEY

- It is a protein, lactose and mineral source.
- It contains 4-7% DM.
- The dry matter contains 1-13% CP (sometimes 9-30% CP), 0.2-1% (sometimes 7-8%) EE.
- The energy value is close to the cob.
- The best form of storage in liquid form is to keep it in tanks.
- From milk whey, which is low in dry matter, a dairy cow may drink 35-40 liters per day (up to 50-70 kg).

- Giving whey to hungry dairy cows within a short period of time can lead to metabolic disorders such as acidosis, tympania and even death.
- Consumption of water temporarily (5-10 hours) may be restricted to adapt the cows to consumption of whey.
- It can also participate in fattening cattle rations.

SWEATING PRODUCTS

- Fat and / or sugar content are high products.
- Milk chocolate is found in 48% fat, 13% CP, 48.7% EE, 4% ADF, 0.6 Mcal NEL / kg.
- the confection contains 22% fat, 5% CP, 5% ADF, 0.5 Mcal NEL / kg.
- 13% CP, 17% EE, 12% ADF, 0.5 Mcal NEL / kg, 0.13% Ca, 0.20% P in mixed confectionery products;

Usage level per animal per day

Confectionery products	< 2.27
Chocolate	0.9 kg/animal/d
Sweetened sugars	0.9-1.8 kg/d

	concentrated feed in dry matter	TMR
Confectionery and blends	% 15	10% (DM)
Chocolate	% 6	4% (in DM)

Other Alternative Feed Ingredients

- Peanut shell
- 17% CP, 16.3% ADF, 0.3 Mcal NEL / kg, 26% EE.
- due to low digestibility, poor taste, high fat content, 15% of concentrated feed should not be more than 7% of full feed (TMR).
- Macaroni and sugar cake are used in limited quantities since they are predominantly starch.
- 15% CP, 3% ADF, 0.4 Mcal NEL / kg.
- The cows are given at a level of 1.8-3.6 kg / day.

Levels of feeding some alternative diets to dairy cows

Yem	% the mixture	kg/cow/d	kg/100 kg BW
Peanut shell	-	1,8	0,3
Bakery industry by-	-	1,8	0,3
Soybean husk	20	2,3	0,4
Cotton seed husk	20	2,3	0,4
Shell cottonseed	-	3,2	0,5

FATS

- It is difficult to meet high energy needs during the peak period of genetically superior and highly productive cows.
- In the early lactation period, fat is added to the diet to reduce weight loss and consequently to increase success with less seeding.

Protected fats

- Strategy of feeding with preserved oils:
 - 1. Protected oils to be added on unprotected 450-700 g of fat are obtained from vegetable and animal sources
 - 2. If the rumen medium is prone to become acidic, add preserved fat
 - 3. In case of weight loss and limited energy intake, preserved fat should be added

BY-PASS PROTEINS AND AMINO ACIDS

● Rendering products and blood products are generally very resistant to fermentation.

Comparison of blood flour with other by-pass proteins

	kg/gün/hay	HP, %	By-pass protein, %
Blood flour	0.35-0.45	88	82
Feather meal	0.5	89	71
Meat-bone meal	1,2	54	70
Meat unu	1,2	65	76
Fish flour	1,0	67	65
Corn gluten meal	1,3	67	58

Nutrient (%) and energy values (MJ KM) of other alternative feeds

	DM	CP	CF	EE	ash	NFE	ME	Nel	vCP
Grape pod, dry	90.2	13,6	25,5	8,3	7,2	45.4	5,42	2,87	1,9
Grape sugar, dextrose	93.5	0,1	-	-	0,1	99.8	14,20	9,53	-
Lemon pudding,	90.8	7,1	12,8	3,0	8,6	68.5	12,60	8,10	3,7

*1 kalori = 4.184 joule

Amount of nutrients in the topinambur tubers (%)

	KDM	Doğal halde=		
		CP	CF	NFE
Tubers	15.8-30.3	0.7-3.3	0.5-3.3	12.1-23.7
Steamed	24,4	1,8	1	20,1
Dried	90	8	4,5	72,3
baked	24,9	2,2	0,9	20,1
Silage (row)	15,4	3,4	2,1	6,8
Silage (row)	17,8	2,1	1,4	11,2

Topinambur green nutrient values (%)

	DM	CHP	CF	Hash	NfE	dCP
Young, fresh	18	2,1	5,3	1,9	8,4	1,4
Tuber harvest	35	1,7	8	4	20,4	0,4
autumn	30	3	6,5	4	15,5	1,4
Dried green	88	13,3	24	14,3	36,9	

