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THE USE OF EXTRUDED FEED GRAIN AT FORMATION OF FORAGE BEHAVIOR OF CALVES

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***The use of grain extrudates** feeding calves in the dairy period contributes to the formation in animals with desirable type of forage behavior and allows to maintain the average daily weight gain their live weight at the level of 800–900 g of being accustomed to the consumption of fodder.*

***Keywords:** feeding behavior, calves, grain extrudates*

An important role in increasing the efficiency of use of fodder belongs extruding grain part of feeding of young animals. Thus, thermal treatment increases the availability of nutrients, increases their feed value, contributes to the improvement of organoleptic qualities and decontamination feed [1].

Timing behavior calves showed in the first days of life in them yet to develop an appetite for the consumption of other types of feed, besides milk. But in conditions of industrial technology, to reduce the flow of milk to drink calves arises the need for early accustom young to consumption of hay, silage and a concentrate. In our previous observations established that the traditional approach daily gain of live weight of calves are reduced as a rule with 700–800 g in the first month of life when watering the whole milk (6–7 liters per day), up to 250–400 g in the second month, when there is a transition to the use of substitutes of whole milk, add concentrated and roughage to accustom to their consumption. Not uncommon in this period and digestive disorders non-infectious, that reduce the effectiveness rearing.

At the same time, continued growth in live weight of calves during ontogenesis is an important guarantee for the future high breast (for heifers) or meat (bulls) performance [2]. Therefore, the search for factors that increase the attractiveness of high-energy feed for maintaining high rates of increase in live weight in the first months of life calves is an important task in technology industrial livestock [3].

To improve the system of feeding of young animals in milk period with free access to feed us in «UM-Vatutino» in Dnepropetrovsk region relevant research had been undertaken.

Newborn calves red dairy breed (n = 42 heads) were formed in the trial (n = 21 heads) and control (n = 21 heads) group. In the first two months of the experimental bulls were grown in the same conditions – the content of the individual machines with a total area of 0,8 m^2 on deep litter of straw. Whole milk watering for 40 days in the amount of 6 litres per head per day. Starting from the 3 month of the bulls were transferred to group maintenance of the machines, 10 heads in the group. Young research group, beginning with 5 days received at the free access extruded grain cereals (oats, corn, barley – in equal proportion) and soybeans – in the ratio of 4:1. Extrudates grain at thermal processing turned into pieces of yellow-grey.

Complete vegetable oil soybeans after extrusion resembled a short bent «sticks» yellow size 4×10 mm, which are easily crumbled. When translated to the group housing were given extrudes, forages (alfalfa hay) and mineral supplements with feedsng-racks libitum. Silo gobies consumed while a modal distribution – once in a day with feeders.

Fig. Extrudate cereal.

Gobies the control group received the feed with a regime of feeding three times a day – concentrated, juicy and rough – in feeders. Mineral feeding the animals received together with concentrated feeds.

Diet feeding of young animals is designed for energy production growth at the level of 800 g nutritional value of the diet was 2,04–6,12 fodder units in different periods of cultivation.

Taking into account the consumption of feed animals was performed by means of control of feeding the two adjacent day once a month [4]. Nutritious fodder determined by conducting zoochemical analysis by standard methods [5]. Ethological observations were carried out with the use of alphabet elements of animal behavior [6]. Thus, to feed reactions were related expenses of time allowed for consumption gross, juicy, concentrated fodder, water and rumination ; to motor reactions – time costs of moving and playing actions; to brake reactions – time spent on leisure standing and lying [7]. The obtained results were processed by generally accepted methods of mathematical and variation statistics Microsoft Excel (1998) [8]. The used value of the criterion of likelihood of the Stjudent-Fischer. Table adopted the following conventions: * $p < 0,1$; ** $p < 0,05$; *** $p < 0,01$.

It is established that in the 2-month old calves of the study group on 5,36 % were spending less time on the motor actions, including moving less 5,58 %; the braking action – less by 3,49 %, including on rest standing – less 13,82 % (Table 1). Accordingly, when little expenditure technology bulls on 22,63 % spent more time on the stern actions. Feature of the consumption of different types of feeds is to increase their time on 68,97 % while consumption of concentrated fodder. Although their analogues by a regime of feeding 23,38 % of the time spent on the consumption of forage (hay), which can be explained by the peculiarities of feeding in a regime of feeding animals have a limited amount of time to access different feeds. Use feedsng-racks, on the contrary, helps to extend the term of access to fodder and usage more efficient

The cud research animals are also spent on 34,25 % longer than their control counterparts, including expenses on 35,48 % more when rumination recumbent, indicating a more comfortable state their content, compared with bull-calfs with traditional technology.

1. Elements of conduct 2-month bull-calfs ($\overline{X} \pm Sx$)

Ethological reaction	Costs in animals of different groups, minutes	
	research	control
Motor action, in all	261,0 ± 1,80	275,0 ± 1,97**
including moving	129,0 ± 1,25	136,2 ± 1,44**
Game actions	132,0 ± 2,00	138,8 ± 1,36
Braking action	927,6 ± 2,31	960,0 ± 3,73**
Rest standing	152,0 ±1,85	173,0 ± 3,74**
Rest lying	793,0 ± 3,18**	787,0 ± 4,29
Eatability feed	251,4 ± 1,52	205,0 ± 2,24
including gross	50,9 ± 0,62	62,8 ± 1,34**
concentrated	85,5 ± 0,65**	50,6 ± 1,03
milk	17,7 ± 0,15	17,1 ± 0,35
water consumption	10,3 ± 0,26	9,1 ± 0,35
rumination	87,8 ± 0,88**	65,4 ± 1,18
including standing	14,5 ± 0,60	18,9 ± 1,06**
lying	63,0 ± 1,24	46,5 ± 0,86

In the 5-month old calves of the study group on 1,7 % spent more time lying (Table 2), while the control bulls on 9,11 % spent more time on leisure standing that shows less comfortable state their content when feeding regime.

2. Elements of conduct 5-month bull-calfs ($\overline{X} \pm Sx$)

Ethological reaction	Costs in animals of different groups, minutes	
	research	control
Motor action, всього	234,0 ± 1,73	239,0 ± 1,56
including moving	111,4 ± 1,38	112,5 ± 1,71
game actions	122,1 ± 2,02	126,8 ± 2,46
Braking action	758,0 ± 1,23	758,0 ± 2,65
Vacation standing	117,4 ± 1,86	128,1 ± 1,73**
Rest lying	640,6 ± 2,73**	629,9 ± 2,06
Eatability feed	448,0 ± 1,61	443,0 ± 2,26
including gross	106,4 ± 1,09	98,3 ± 1,62
concentrated	77,7 ± 0,62**	64,7 ± 0,86
milk	127,8 ± 1,94	146,0 ± 3,79**
water consumption	29,9 ± 0,41	28,2 ± 0,80
rumination	106,2 ± 1,07	105,8 ± 1,27
including standing	15,5 ± 0,45	18,7 ± 0,97
lying	90,7 ± 1,19	91,1 ± 1,96

Research gobies also by 20,1 % spent more time on consumption of concentrated fodder, while their control counterparts by 14,24 % paid more attention to the consumption of succulent fodder.

In General, it should be noted that in this age of significant ethological differences between animals when holding on different technologies is not installed.

Determination of the actual nutrient components of feeding of young animals (Table 3) showed that the nutritional value of grain extrudat was 10 % more than the nutritional value of the average sample of its original grain components (corn, oats and barley).

Also noted improvement of organoleptic the properties of the feed – present resistant pleasant aroma, which helped strengthen the stern reaction calves to the specified grain extrudate. When extrudate soy also improvement was noted in its organoleptic qualities, although the nutritional value increased slightly by 1,4 %.

3. The chemical composition of grain feed for calves treatment groups

The name of the feed	Chemical composition of natural food in percentage, %							Nutrition, fedding unit
	moisture	crude protein	crude cellulose	crude ash	crude fat	calcium	phosp-horus	
Extrudate cereal	11,26	11,16	4,73	3,31	2,28	0,10	0,10	1,21
Extrudate soy-bean	8,52	19,91	3,28	4,45	18,82	0,30	0,18	1,47
Grain soy-bean	8,82	20,34	2,99	5,27	18,44	0,28	0,19	1,45
Barley	15,06	11,38	3,75	2,82	1,16	0,10	0,10	1,14
Oats	16,21	11,81	8,77	4,15	0,89	0,12	0,10	0,88
Corn	15,51	9,19	1,43	1,36	3,44	0,08	0,09	1,27

Taking stock of feed intake (Table 4) showed that almost the same level of feeding in the consumption of nutrients differences were observed, as a consequence of different forage behavior of mode of feeding and free access to the grave and concentrated feed.

So, gobies research group, on average, consumed 6,86–27,58 % more nutrients, with the biggest difference in feed intake was observed in 2–4 months of age, when differences were 16,71– to 27,58 %.

For the entire period of cultivation gobies research group consumed on 12,87 % more nutrients. Features of eating fodder has also been reflected in the dynamics of increase in live weight of the experimental animals. These results show that when setting the bulls were analogues in live weight ($p > 0,05$).

4. Consumption of nutritives by experimental animals

Period	Indicators		
	fodder units, f.u	energy intake, mJ	digestible protein, kg
Research group			
0–1	81,94	709,22	8,491
1–2	87,14	862,76	10,188
2–3	90,3	1057,41	9,969
3–4	129,52	1499,84	14,215
4–5	146,14	1706,96	15,706
5–6	171,5	2032,4	18,521
In oll	706,54	7868,59	77,09
Control group			
0–1	76,68	654,42	8,284
1–2	78,10	748,86	9,623
2–3	70,78	821,12	8,431
3–4	110,98	1313,87	13,575
4–5	129,92	1479,27	14,87
5–6	159,52	1935,14	19,497
In oll	625,98	6952,68	74,28

Starting from the 1st of the month, when transferring to a system of feeding grain extrudent, the animals of the experimental group began more efficient use of nutrients of the diet feeding. The biggest difference in gross and daily increments of live weight experimental bull-calfs was marked in the period.

At the subsequent growing of divergence in the increases of living mass became something leveled as a result of adaptation of animals of control group to the terms of maintenance. In to 5–6-monthly a difference in the increases of living mass of experimental bull-calfs was statistically unbelievable ($r > 0,05$).

The use of technological improvements was instrumental in the increase of living mass 6-

monthly bull-calfs of experimental group on 16,43 % in comparing to their animals the same age of control group (r < 0,05) (Table 5).

5. Indexes of the productivity of bull-calfs $(\overline{X} \pm Sx)$

Age of animals, monts	Group of animals					
	research			control		
	live mass, kg	increase at		live mass, kg	increase at	
		period, kg	twenty-four hours, g		period, kg	twenty-four hours, g
0 (new-born)	34,67 ± 0,37	-	-	34,81 ± 0,2	-	-
1	58,67 ± 0,43	24,00 ± 0,43	774,19 ± 13,72	58,71 ± 0,29	23,90 ± 0,34	771,12 ± 11,11
2	83,52 ± 0,39**	24,86 ± 0,30**	801,84 ± 9,78**	69,67 ± 0,67	10,95 ± 0,73	353,30 ± 23,50
3	107,38 ± 0,46**	23,86 ± 0,34**	852,04 ± 12,15**	86,29 ± 0,62	16,62 ± 1,04	593,54 ± 37,17
4	133,52 ± 0,58**	26,14 ± 0,45**	843,32 ± 14,48**	106,76 ± 0,59	20,48 ± 0,65	660,52 ± 20,96
5	158,90 ± 0,62**	25,62 ± 0,39	852,52 ± 12,72	132,38 ± 0,58	25,62 ± 0,57	853,97 ± 19,02
6	186,90 ± 0,80**	28,24 ± 0,25	907,62 ± 8,37	160,52 ± 0,78	28,14 ± 0,58	907,80 ± 18,79

Conclusion: the use of corn extrudates in feeding of bull-calfs at their growing on littleexpense technology was instrumental in forming of the desired type of feed conduct and increase of them living mass in to 6-monthly age on 26,38 kg in comparing to their control analogues at traditional technology of growing (r < 0,05).

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Анотація

Олійник С. О. Використання екструдованих зернових кормів при формуванні кормової поведінки у телят. *Використання екструдованих зернових кормів при годівлі телят у молочний період сприяє формуванню у тварин бажаного типу кормової поведінки і дає можливість підтримувати середньодобові прирости живої маси на рівні 800–900 г при привчанні їх до споживання грубих кормів.*

Ключові слова: *кормова поведінка, телята, зернові екструдати.*