

EVALUATION OF THE CHARACTERISTICS OF OXIDATIVE SPOILAGE OF MIXED FEED CONCENTRATE FOR CATTLE

Biochemical processes occurring in feed lead to changes in their chemical composition, which can negatively affect animal productivity. In this regard, it is important to determine the characteristics of oxidative processes of spoilage of compound feed that occur during its storage.

The aim of the study was to determine the level of acid number and peroxide number in concentrated compound feed for cattle during the shelf life.

Object of the study: KDK-61S compound feed concentrate for highly productive cows during the stall period according to GOST 9268 [1], purchased in the retail trade network.

Subject of the study: acid number, characterizing the amount of free fatty acids and other alkali-neutralizing substances accompanying triglycerides (mg KOH/1 g); peroxide number, characterizing the amount of primary lipid oxidation products (hydroperoxides and peroxides) (1/20 mmol/kg).

The essence of the acid number study method lies in the volumetric titration of free fatty acids extracted from the product by extraction with ether or chloroform in a glass column according to GOST 13496.18 [2].

The method for studying the peroxide value is based on the reaction of interaction of lipid oxidation products (peroxides and hydroperoxides) contained in the product under study with potassium iodide in a solution of acetic acid and chloroform, followed by quantitative determination of sodium thiosulfate released by the iodine solution by the titrimetric method according to GOST 31485 [3].

The study was conducted according to the following algorithm:

- a sample of compound feed prepared for the study was obtained;
- acid and peroxide values were determined;
- the sample was analyzed and stored at a temperature of 3°C and 25°C;
- repeated studies of acid and peroxide values were conducted at intervals of 14 days during the shelf life. The results of the study are presented in the table.

Table – The level of acid and peroxide numbers of mixed feeda for cattle

Storage temperature, °C	Indicator	Research stage				
		1	2	3	4	5
3	Acid number, mg KOH/ g	30,74	30,54	32,86	37,17	39,31
25			29,32	33,44	35,91	41,27
3	Peroxide value, 1/2Ommol/ kg	13,79	15,03	18,78	16,03	19,85
25			13,03	15,27	20,52	23,78

According to the data presented in the table, it is evident that the acid number level increased during the storage period of the samples. The increase of this indicator relative to the initial level at 3°C was 27.9 %, at 25°C – 34.3 %. The peroxide number level also increased, its increase relative to the initial level was 43.9 % and 72.4 % at 3°C and 25°C, respectively.

The level of acid and peroxide numbers at the final stage at a storage temperature of 3°C is lower than at 25°C. From which it can be concluded that the processes of oxidative spoilage of compound feed in the air environment are less intense at low temperatures, which has a positive effect on the quality of the stored product.

The nature of the change in these indicators, the presence of a correlation between them will be further studied as part of the work on the master's thesis.

REFERENCES

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