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INCREASING THE STABILITY OF COMBINED FEED DURING ITS STORAGE

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Compound feed plays an important role in feeding livestock and poultry in large-scale agriculture. Therefore, ensuring the quality of compound feed is very important from an economic point of view and plays a decisive role in increasing the profitability of livestock and poultry farming. The compound feed industry produces mixtures of various ingredients (raw materials), which are combined in various combinations and proportions. This defines the name of the compound food. Compound feed is a balanced mixture of different feeds and micro-additives, made according to a specific recipe for each group of animals for complete nutrition of farm animals. Combined feed, containing nutrients necessary for the animal, enriched with trace elements (premixes), which have a positive effect on productivity and allow to increase productivity by 30%. Therefore, it is important to ensure the quality of compound feed during storage and use of substances that do not impair product quality. The main task in the production of compound feed is to create a consistency that meets the high caloric needs of livestock, poultry and poultry and ensures their growth, formation and maintenance.

Key words: *compound feed, storage, antioxidant, term, quality.*

PROBLEM

Compound feed must meet the permit requirements for compound feed intended for feeding animals of any sex, age or species. The existing national and international regulatory documents mostly do not cover the indicators of quality and safe use of the produced compound feed [1, 2, 4].

ANALYSIS OF THE LATEST RESEARCH

Complete rations have clearly defined moisture, crude protein, fiber, calcium, phosphorus, table salt, lysine, methionine, cystine, grain size and degree of grinding. Compound feeds are developed in such a way that the disadvantages (for example, low protein content, vitamin deficiency) are compensated by other advantages. The key point in the production of compound feed is the production of compound feed that meets the needs of livestock, domestic animals and poultry. To increase the stability of feed during storage, it is recommended to use Sal Kurb Dry (Kemin, Belgium) - a food additive that prevents the reproduction of pathogenic microflora in raw materials and animal feed and prevents re-infection during storage, transportation and processing [3, 5, 8, 11]. Sal Kurb Dry is a synergistic antimicrobial a composition of organic acids, salts and surface-active substances used in animal husbandry, which prevents the reproduction and spread of unfavorable microflora in feed used for poultry, and prevents secondary infection during storage, transportation and processing.
The recommended rate of introduction into feed.
- To fight infections - 1-2 kg/t
- For decontamination of fodder - 3-10 kg/t
- For disinfection of silos - 0.5-2 kg/10 m3.

According to the recommendations for the use of Sal Carb, as a precaution, add the drug at the rate of 1-3 kg per ton of product.

RESEARCH RESULTS

Our task was to determine a reasonable correlation between the mode of preservation and the amount of added antioxidant [6,10,12]. Antioxidants were added to products from 0 to 3 kg at different humidity and storage temperature. Based on the results of the study, the histological data (appearance of malt odor) contained in Tables 1 and 2 were processed and graphs were drawn. From the analysis of tabular data and graphs, it can be shown that, taking into account the practical conditions of production, it is advisable to add antioxidants at the rate of 2.5 kg at a raw material humidity of 13 and a storage temperature of 18°C.

Table 1. **Change in the quality indicators of compound feed during storage τz before the appearance of a malty smell depending on the amount of antioxidant Sal Curb dry ωck (kg/t) at a relative air humidity φ, 75%**

Storage mode	τ_{31}	τ_{32}	τ_{33}	τ_{34}	τ_{35}	τ_{36}	τ_{37}
	$\omega_{ск}$=0	$\omega_{ск}$=0,5	$\omega_{ск}$=1,0	$\omega_{ск}$=1,5	$\omega_{ск}$=2.0	$\omega_{ск}$= 2,5	$\omega_{ск}$= 3,0
Moisture content of compound feed, w	days	days	days	days	days	days	days
16	30	39	44	49	52	55	55
14,5	53	59	65	71	75	81	82
13	59	67	75	80	83	89	89
12	61	73	81	87	89	91	91

Table 2. **Changes in the quality indicators of compound feed during storage τz before the appearance of a malty smell depending on the amount of added antioxidant Sal Curb dry ωcк (kg/t) at relative air humidity φ, 75% and variable temperature indicators.**

Storage mode	τ_{31}	τ_{32}	τ_{33}	τ_{34}	τ_{35}	τ_{36}	τ_{37}
	$\omega_{ск}$=0	$\omega_{ск}$=0,5	$\omega_{ск}$=1,0	$\omega_{ск}$=1,5	$\omega_{ск}$=2.0	$\omega_{ск}$= 2,5	$\omega_{ск}$= 3,0
Temperature, t 0C	days	days	days	days	days	days	days
20	28	32	35	37	40	43	43
18	37	45	54	59	67	71	71
5	45	63	74	77	81	88	88
0	115	129	141	150	170	173	173

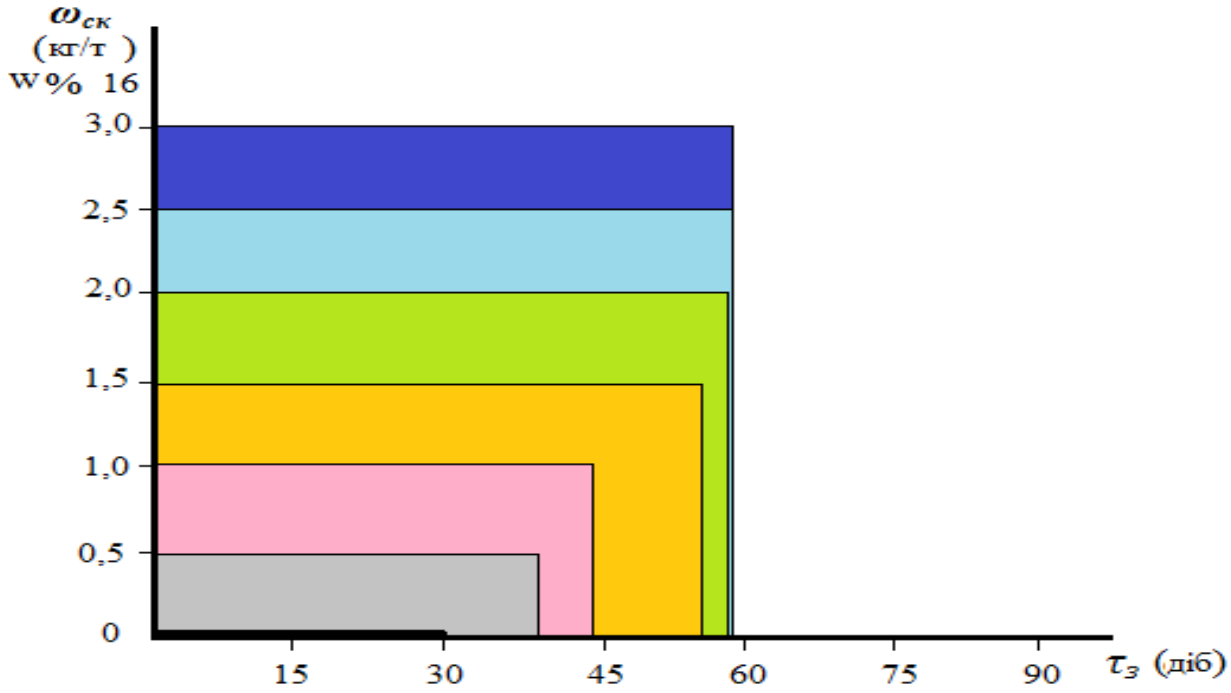

Fig. 1. Change in the quality of compound feed during storage τz before the appearance of malt odor depending on the amount of antioxidant Sal Curb dry ωск (kg/t) at relative air humidity φ, 75%, compound feed moisture W, 16%

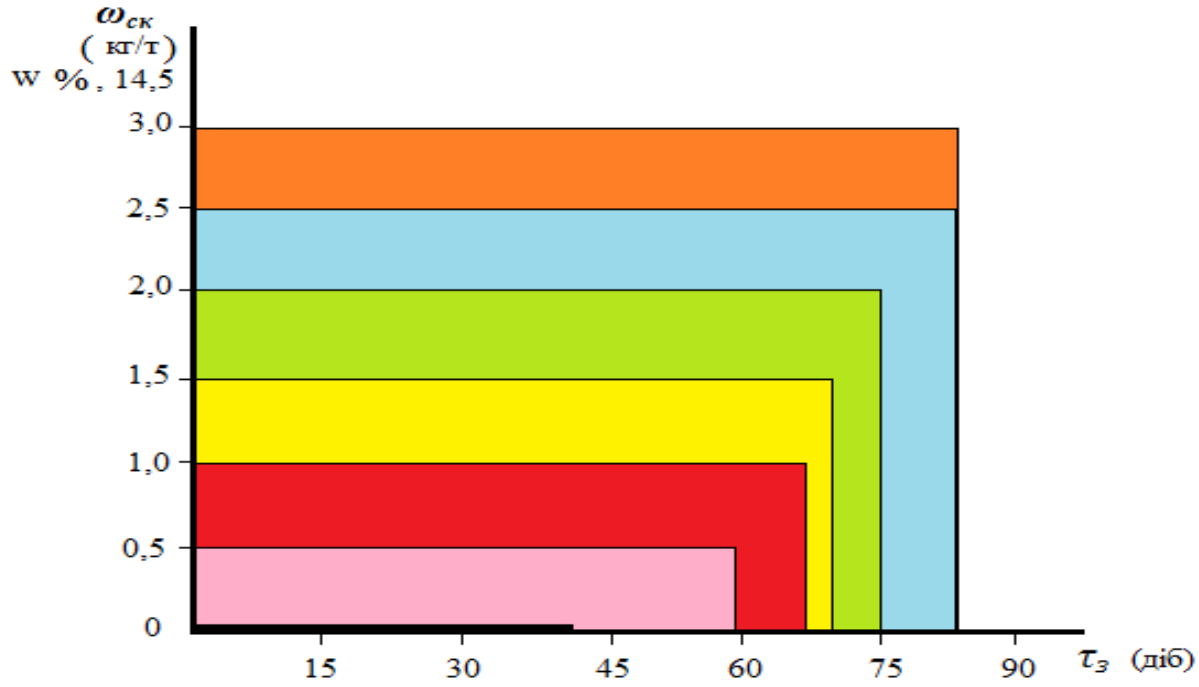

Fig. 2. Changes in the quality indicators of compound feed during storage τz before the appearance of malt odor depending on the amount of antioxidant Sal Curb dry ωск (kg/t) at relative air humidity φ, 75%, compound feed moisture W, 14.5%

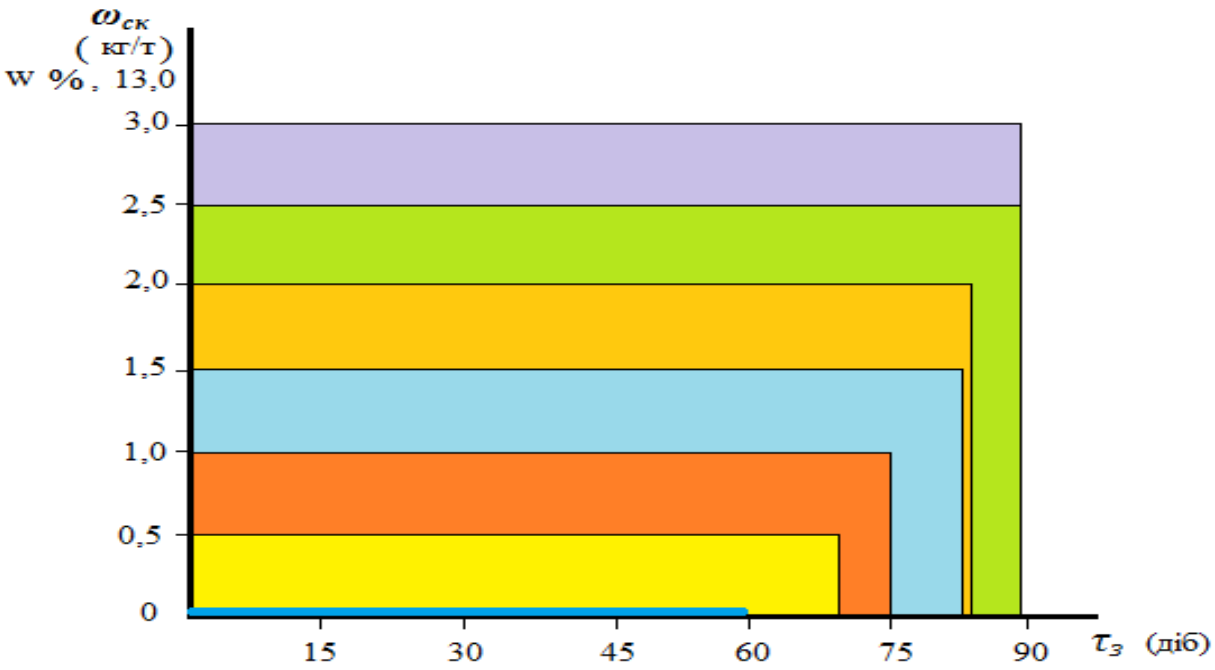

Fig. 3. Changes in the quality indicators of compound feed during storage τz before the appearance of malt odor depending on the amount of antioxidant Sal Curb dry ωск (kg/t) at relative air humidity φ, 75%, compound feed moisture W, 13%

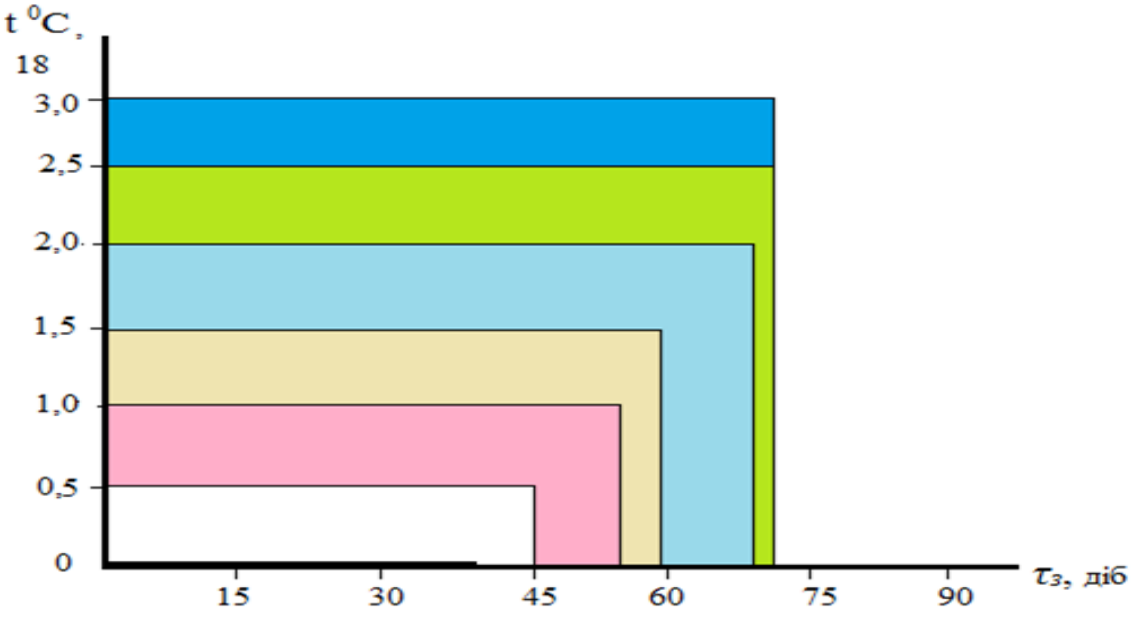

Fig. 4. Changes in the quality indicators of compound feed during storage τz before the appearance of malt odor depending on the amount of antioxidant Sal Curb dry ωск (kg/t) at relative air humidity φ, 75% temperature, to C, 18

CONCLUSIONS

The dependence of bulk feed storage on humidity, temperature, and the amount of added antioxidant was determined. According to the study, the antioxidant Sal Curb dry is recommended to be added to compound feed in the amount of 2.5 kg per ton of product. The optimal storage temperature was 18°C and 13% humidity.

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ПІДВИЩЕННЯ СТІЙКОСТІ КОМБІКРМУ ПІД ЧАС ЙОГО ЗБЕРІГАННЯ

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Комбікорм відіграє важливу роль у годівлі худоби та птиці у великому сільському господарстві. Тому забезпечення якості комбікормів є дуже важливим з економічної точки зору і відіграє визначальну роль у підвищенні рентабельності тваринництва та птахівництва. Комбікормова промисловість випускає суміші з різних інгредієнтів (сировини), які поєднуються в різних поєднаннях і пропорціях. Це визначає назву складеної їжі. Комбікорм — це збалансована суміш різних кормів і мікродобавок, виготовлених за певною рецептурою для кожної групи тварин для повноцінного харчування сільськогосподарських тварин. Комбікорм, що містить необхідні для тварини поживні речовини, збагачений мікроелементами (премісами), які позитивно впливають на продуктивність і дозволяють підвищити продуктивність на 30%. Тому актуальним є забезпечення якості комбікорму під час зберігання та використання речовин, що не погіршують якість продукції. Основним завданням при виробництві комбікорму є створення консистенції, що відповідає високим потребам у калорійності худоби, птиці та птиці та забезпечує їх ріст, формування та утримання.

Ключові слова: *комбікорм, зберігання, антиоксідант, термін, якість.*