

**РЕЗЮМЕТА НА НАУЧНИТЕ ТРУДОВЕ СЛЕД ПРЕДХОДНА ХАБИЛИТАЦИЯ
НА ДОЦ. Д-Р ИНЖ. ВАНЯ ПЕТРОВА ДИМОВА**

Представени за участие в конкурс за заемане на академична длъжност „Професор“

Област на висше образование: 5. Технически науки

Професионално направление: 5.13. Общо инженерство

Обявен в Държавен вестник бр. 56/19.07.2022 г.

В.4	Научни публикации (не по-малко от 10) в издания, които са реферирани и индексирани в световноизвестни бази данни с научна информация (За самостоятелна публикация се зачитат 60 точки. При съавторство се зачитат 60/п точки, като п е броят на съавторите)
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1. **Dimova V.**, D. Dinev, Y. Popova, Y. Mitev. 2011. Comparative technical and economic analysis of variants for cleaning and storage of manure on a farm for 108-120 dairy cows. *Agricultural science and technology*. An International Journal, published by Faculty of Agriculture, Trakia University, Stara Zagora, Bulgaria, Vol, 3, No 4: 359-367, ISSN 1313-8820

Abstract. The objective of the study is to develop and explain from a theoretical and analytical point of view suitable and economical design solutions for a farm for 108-120 dairy cows with different systems of cleaning and storage of manure and afterwards to prepare a comparative analysis of their most important technological and technical and economic parameters. A total of 2 technological variants for free rearing of cows in a three-line building with end food trail have been compared (one variant for cleaning solid manure by a tractor with a bulldozer shovel and its storage on a site fenced from three sides with reinforced concrete walls and bottom linked through a ditch to a dug-in liquid manure scoop pit and one variant for cleaning liquid manure by a scraper installation and its storage in a reinforced concrete semi-dug lagoon). It has been found out that the variant with a solid manure management system is more economical by relative: built-up area and volume, costs of basic construction materials (concrete, reinforcement and structural steel) and investment costs for constructing the technological profile of the floor of the building, as well as the facilities and equipment for cleaning, transportation and storage of manure. It requires 1,97 times less capital investments (971,30 EUR/stock place) for both constructing and equipping the farm with the variant for liquid manure management (1909,30 EUR/stock place).

Keywords: buildings, cows, cubicles, technological profile of the floor, concrete manure storages, slurry and solid manure

2. Miteva Tch., T. Penev, Zh. Gergovska, J. Mitev, N.Vasilev, **V. Dimova**. 2012. Changes in the hindleg conformation and their relation to lameness, production system and lactation number in dairy cows. *Agricultural science and technology*, An International Journal, Published by Faculty of Agriculture, Trakia University, Stara Zagora, Bulgaria, Vol. 4, No 4: 382-387, ISSN 1313-8820

Abstract. The study was performed at three dairy cattle farms from three districts in the country: Plovdiv, Bourgas, and Veliko Tarnovo. The cows housed at all three farms were of the Holstein-Friesian breed. A total of 150 cows were included, 50 from each farm. The rearing at the three farms was free with differences in some technological details. The following traits were recorded: hindleg conformation score examined from behind (HLCS), lameness score (LS), body condition score (BCS) of the cows. It has been established that by

increasing the age (lactation number), the mean hindleg conformation score increased, respectively from 1.22 at the 1st to 2.29 at the 4th or following lactations. The cows with normal hindleg conformation (HLCS 1) had a mean lameness score of 1.13, which indicated that they did not have any major locomotory problems. The cows with the most considerable hoof overgrowth and change in the leg conformation score (HLCS 3) had the highest lameness score (2.33). The cows without locomotory problems (LS 1) had the highest mean BCS (2.54) compared to those with varying degrees of lameness. The cows with LS 3 had the lowest BCS (1.90). There was a tendency towards a lower extent of fattening in cows with locomotory problems. There were no significant differences in the mean values of HLCS and LS between the three farms, yet there was a difference in the percentages of cows with different scores. The causes can be found in the technological differences of rearing, feeding, etc.

Keywords: hindlegs conformation, laminitis, body condition score, dairy cows

Abbreviations: LS – Lameness score, BCS – Body condition score, HLCS – Hind legs conformation score

3. **Dimova V.**, R. Georgiev, Ch. Miteva, N. Nedelcheva, 2012. Comparative technical and economic analysis of systems for liquid manure management, *Agricultural science and technology*, An International Journal, Published by Faculty of Agriculture, Trakia University, Stara Zagora, Bulgaria, Vol. 4, No 4: 445-449, ISSN 1313-8820

Abstract. The objective of the study is to make a comparative analysis of the most important technical and economic parameters of technological variants for cleaning, storage and treatment of liquid manure, in order to develop and explain from a theoretical and analytical point of view economical design solution of a system for manure management in a pig farm. To achieve the objective the amount of manure and urine produced in a real farm in Bulgaria with a capacity of 3704 pigs has been determined, a detailed technical and technological project of the facility for storage of liquid manure ("lagoon" type) has been developed and the technological processes for existing farm system for manure separation have been examined and detailed. The total built-up areas and volumes for both variants of the system for managing liquid manure and the initial investment costs for constructing and equipping with equipment have been defined, as on this basis a comparative technical and economic analysis has been made and a preferred variant for the practice has been proposed. It has been found out that the variant with a liquid manure separating system is more economical than the variant with a semi-buried scrape lagoon by the volume and planning parameters: by total built-up area - by 7,4% and by total built-up volume - 2,1 times, which brings less pollution to the environment. The variant with a lagoon is more economical than the one with a liquid manure separating system by the following parameters: by total construction cost for building the manure storage facilities - 2,2 times, by total cost of the manure management equipment - 2,6 times, by total investment costs for constructing and equipping with manure management equipment for the manure storage facilities - 2,4 times.

Keywords: liquid manure systems, concrete manure storages, technical and economic parameters

4. **Dimova V.**, J. Mitev, Tch. Miteva, Y. Popova, N. Vasilev, 2012. Evaluation of some zoohygienic parameters in a semi-open free-stall dairy barn, *Trakia Journal of Science*, Vol. 10, No 2: 102-108, ISSN 1313-7050 (Biomedical Sciences)

Abstract. The aim of the present research was to evaluate some of most important zoohygienic indicators on the basis of a preliminary technical and technological layout of a semi-open free-stall dairy barn for housing of 74 cows. The study was performed on a large dairy barn with longitudinal sidewalls replaced by retractable curtains, with three rows of cubicles (one outer row and one inner double row) located on one side of an external feeding alley, and manure cleaning system using electrically driven delta scrapers. The latter move the manure from alleys to a transverse collecting channel located in one end of the barn. By means of a back-and-forth conveyer, the manure is transferred to an earthen manure collecting pit to the south part of the barn and by an inclined conveyor belt, entered directly into an adjacently located solid manure storage facility. Feed is dispensed by a feed wagon (mixer) on the periphery of the feed alley, lined with terracotta pots. The

milking is done in a 2x4 herringbone-type milking parlour. The investigated modern half-open large three-row dairy barn for free rearing of 74 dairy cows provided a technological solution for ensuring the comfort of animals according to the following zoohygienic parameters: relative built-up area, built-up volume, drinking space width and lighting parameters. The evaluated technological layout of a large barn with curtain longitudinal sidewalls, perpendicularly located milking parlour with machinery and sanitary rooms, offices, parturition room created good preconditions for animal housing, suitable for newly constructed barns or modernization of dairy cattle farms for 70-80 cows in Bulgaria.

Keywords: semi-open building, cows, technological decision, hygienic indicators

5. Mitev J., I. Varlyakov, T. Miteva, N. Vasilev, J. Gergovska, K. Uzunova, **V. Dimova**. 2012. Preferences of Freestall Housed Dairy Cows to Different Bedding Materials. *Journal of the Faculty of Veterinary Medicine*, University of Istanbul, 38 (2): 135-140, **SJR=0.101/2012**, ISSN 0250-2836, <https://dergipark.org.tr/tr/pub/iuvfd/issue/18530/195602>

Abstract. The purpose of this study was to examine the behaviour of dairy cows during the rest periods and their preferences to different bedding materials with limited amount of straw as well as the hygienic score of dairy cows. Thirty-six Holstein dairy cows at the first to fourth lactation with live weight 610 ± 58 kg and milk yield of 7364 ± 1202 liter for 305 days of lactation were used for the experiment. Three types of bedding materials were used for the preference test – rubber mats, manure-straw bedding and sand. The hygienic score of the animal's body was made by 4 point system. The average values of the studied functional activity (FA) were determined by using a mathematical model adapted for this purpose. The installed soft rubber mats on concrete floor mitigated the adverse effects on animal behaviour at rest. The lying time (iFA-0.4133) on the rubber mats and the number of lying down (21.2) during the day showed that rubber mats are more comfortable for cows than manure-straw bedding and sand. When using a small amount of straw bedding, the cows preferred to lie longer on soft rubber mats. The hygienic score of the body of dairy cows was between 1.40 and 2.94, and depended on floor bedding and the regular cleaning of the stall.

Keywords: Cow comfort, freestall, dairy cows, behavior, bedding materials

6. Penev T., Z. Manolov, I. Borissov, **V. Dimova**, Tch. Miteva, Y. Mitev, V. Kirov. 2013. Investigations on friction coefficients of cow hooves with different dairy farm floor types. *Agricultural science and technology*, An International Journal, Published by Faculty of Agriculture, Trakia University, Stara Zagora, Bulgaria, Vol. 5, No 3: 305-308, ISSN 1313-8820.

Abstract. The investigation was performed in three Bulgarian free-stall cattle farms with different flooring types. The floor of farm A was covered with two rubber mat types, with and without abrasion lining. At the other two farms, floors were made of grooved concrete which was used for 6 years (farm B) and for 4 years (farm C). The purpose of the investigation was to determine the friction coefficients on the different floorings with tribometer described by Phillips and Morris (2000) and the influence of some factors as usage period, presence of manure and water on the floor. The coefficient of static friction of dry floors at the studied farms varied from 0.46 on the concrete floor at farm B to 0.59 on the rubber floor with abrasion lining. It indicated that dry floors at the surveyed farms provided good safety for standing animals. The dynamic friction of dry floors was the lowest at farm B – 0.44, and the highest on the rubber floor with abrasion lining at farm 1-0.56. When water was spilled on the floor, static friction coefficients of all studied floorings decreased except for the rubber floor with abrasion lining, where it increased up to 0.61. The dynamic friction coefficients were lower when all floors were wet. The lowest dynamic friction coefficient was determined on the floor at farm B -0.39, which is under the critical minimum. This was attributed to its longer usage and thus, its wearing and smoothing. Static friction coefficients on manure-covered floors varied from 0.4 to 0.49. The lowest dynamic

friction coefficient (0.36) was measured on the floor at farm B, and the highest (0.46) - on the rubber floor with abrasion lining, farm A.

Keywords: coefficient of dynamic friction, coefficient of static friction, hooves, rubber floor, concrete floor

7. Georgiev R., V. Dimova, K. Peichev, P. Georgiev. 2014. Optimization of thickness of thermal insulation for roofs of turkey's houses. *Agricultural science and technology*, An International Journal, Published by Faculty of Agriculture, Trakia University, Stara Zagora, Bulgaria, Vol. 6, No 1: 40-43, ISSN 1313-8820

Abstract. The thermal insulation of roofs of laying turkey hen houses is discussed. The mean monthly temperatures for the respective region were used to determine monthly heat losses through a roof of various thermal insulation thicknesses (40, 60, 80, 100, 120 and 140 mm). The annual heat losses through the roof were calculated as the sum of the monthly heat losses. Then, these losses were used to determine the amount of fuel, and the equivalent cost in Euro to cover such energy losses. Depreciation expenses were determined on the basis of the cost of the thermal insulation (panels) per 1 m² over an operational lifetime of 25 years. The sum of the annual energy costs to cover the thermal losses through the roof and the depreciation expenses was used to determine the annual discounted costs of the thermal insulation. The resulting dependence of the discounted costs on the thermal insulation thickness makes it possible to determine the thickness at which the discounted costs are the lowest, i.e. the optimal cost-effective thickness. When using wood pellets and black coal as heating fuel for laying turkey hen houses, the economically feasible thickness of thermal panels is 10–14 cm.

Keywords: thermal insulation, poultry houses, optimization, annual energy costs

8. Peychev K., D. Georgiev, V. Dimova, V. Georgieva. 2017. Analysis of the technological dairy cows traffic "to and from" herringbone milking parlors. *Agricultural science and technology*, An International Journal, Published by Faculty of Agriculture, Trakia University, Stara Zagora, Bulgaria, Vol. 9, No 2: 119-123, ISSN 1313-8820 (Print), ISSN 1314-412X (Online)

Abstract. The aim of this study was to analyze the behavioral responses of milked cows and throughput performance of a herringbone milking parlor of capacity 2x10. For this purpose, 120 cows, of which about 100 milked, housed in an existing undivided compost bedded-pack barn (manure with minimum straw tilled on a daily basis), were investigated. Cows were milked three times per day in a 30-degree 2 x 10 herringbone parlor. A real-time monitoring system was designed, developed and installed to obtain the required information. A steady trend of difference between entrance and exit routines in cows from the left and right platform of the milking parlor was found. The most likely reason is the difference in illumination between the two milking platforms, and also direction of the exit traffic. Groups of cows who turned at 180° had longer exit time, irrespective of the shorter distance covered. Milking duration within the range of the three milkings showed a clearly defined rate. Morning milking was of the shortest duration, although the one-time absolute milk yield is the highest in the morning. The most likely explanation for it is the higher oxytocin release in the early hours of the day as a result of the reduced impact of the surrounding stress factor. Often cows from the left platform would come into contact with those from the right platform and delay movement to the selection gate. Therefore, an optically impenetrable barrier would be required to be installed on the gate.

Keywords: herringbone milking parlors, cow traffic, exit-entrance areas, selection gate (s), cow behavior, planning and design

9. Georgiev R., K. Peychev, V. Dimova, D. Georgiev. 2018. Theoretical analysis of the heat energy savings in wood pellets production. *Agricultural science and technology*, An

Abstract. The report includes a theoretical analysis of the heat energy savings in the drying of wood biomass with desiccant fumes. With the current technological schemes for drying wood pellets most heat is lost with the exhaust fumes. To use the heat of exhaust fumes it is proposed to utilize these by a heat exchanger recuperator type, which transfers part of the heat of the exhaust gas to the fresh air entering the dryer installation. Thus, about 25% of the heat for drying biomass can be saved. The report examines the relationship between outdoor temperature and condensation of moisture from the exhaust gases on the relative share of energy saved using a heat exchanger.

Keywords: wood biomass, heat savings, desiccant fumes, exhaust fumes, heat exchanger recuperator

10. Peychev K., D. Georgiev, G. Dineva, V. Dimova. 2019. Structure-time analysis and development of dairy cows machine milking models in “Herringbone” milking parlors. *Bulgarian Journal of Agricultural Science*, 25 (Suppl. 3): 196-200, **SJR=0.191/2019**, ISSN 1310-0351, ISSN 2534-983X, https://journal.agrojournal.org/page/en/details.php?article_id=2603

Abstract. A real-time video monitoring of the milking process in three “Herringbone” milking parlors with capacities ranging from 2x6 to 2x10 was carried out. On the basis of the archived data the duration of all milking udder preparation operations (washing, drying and attaching of milking units) is timed. Based on the accumulated experimental information from the three monitored objects four recommended models were developed for the sequence of work in preparing animals for milking in „Herringbone“ milking parlors. Models I and II have been found to be suitable for use in „Herringbone“ milking parlors with a capacity of up to 2x6. Model III is applicable for parlors with a capacity up to 2x8 and model IV can be used in parlors with a capacity up to 2x10.

Keywords: milking parlors; machine milking; technological operations

Г.7	Научни публикации в издания, които са реферирани и индексирани в световноизвестни бази данни с научна информация (За самостоятелна научна публикация се зачитат 40 точки. За научна публикация в съавторство се зачитат 40/п точки или разпределени в съотношение на базата на протокол за приноса, като п е броят на съавторите)
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1. Оджакова Ц., Й. Попова, С. Лалева, П. Славова, В. Димова. 2010. Икономическа ефективност на отглеждането на каракачанската порода овце. *Животновъдни науки*, 3: 24-27, ISSN 0514-7441

Abstract. The rate of profitability of rearing the Karakachan breed of sheep was analysed. The objective of the study was the Karakachan flock at the Experimental Station of Agriculture and Animal Husbandry (ESAАН) - Smolyan, which consists of 150 ewes and 80 lambs and yearlings. The animals were reared in the barn and on the pasture. The feeding was according to the productivity, physiological stage and the age of the animals. The animals were served by two shepherds. The income and expenses were estimated based on the 2007 ruling prices. It was found that:

- The rearing of animals from the Karakachan sheep breed is economically profitable under the conditions of the study.
- Care should be taken to protect the lambs born and to increase the number of the realized lambs per ewe per year.

- For maintaining of the number of the Karakachan breed it is necessary to utilize the means from Measure 214 “Agroecological payment” of the Program for development of the rural regions for the period 2007-2013.

Keywords: sheep, incomes, rate of profitability, lambs

2. **Dimova V.**, D. Dinev, Y. Popova. 2010. Comparative analysis of some investments costs for free rearing female breeding calves. *Agricultural science and technology*. An International Journal, published by Faculty of Agriculture, Trakia University, Stara Zagora, Bulgaria, Vol. 2, No 4: 202-210, ISSN 1313-8820.

Abstract. The objective of the study is to compare and analyze investment costs for construction and technological equipment of buildings with different way for free rearing of female breeding calves, as a result of which to define the most economical and practically recommendable solutions with different capacity of dairy cattle-breeding farm. A total of 8 technological variants for freestall rearing of female calves and heifers in farms for 40, 60, 80 and 100 cows have been compared (4 variants for buildings with group cubicles on a sloping floor – for calves 3 to 18 months old and with Butterfly landings for heifers and 4 variants for buildings with group cubicles on straw bedding). It has been established that with the same farm capacity the variants for buildings with group cubicles on a sloping floor for calves and with a Butterfly landing for heifers are more economical than buildings with group cubicles on straw bedding by relative construction cost of the load bearing and fencing structures and by relative total construction cost, but they are more capital-intensive by relative construction cost of the floor profile. By increasing the farm capacity from 40 to 100 cows the parameters of the two types of technological variants (with group cubicles on a sloping floor for calves and Butterfly landing for heifers and with group cubicles on straw bedding) decrease – the relative construction cost of the technological profile drops from 299 to 203 BGN/st.pl. (up to 47,3 %), the relative construction cost of the load bearing and fencing structures drops from 1388 to 832 BGN/st.pl. (up to 66,8 %), the relative total construction cost - from 1650 BGN/st.pl. to 1080 BGN/st.pl. (up to 52,8 %). The variant with group cubicles on a sloping floor for calves and with Butterfly landing for heifers on a farm with capacity for 100 cows is the most economical – up to 66,8 % by relative construction cost of the load bearing and fencing structures of the buildings and up to 52,8 % by relative total construction costs. The variant with group cubicles on straw bedding on a farm with capacity for 100 cows is more economical up to 47,3% than the other variants by relative construction cost of the floor profile.

Keywords: buildings, female calves, heifers, technological floor profile, load bearing and fencing structures, technical and economic parameters

3. Попова Й., Ц. Оджаклова, С. Лалева, П. Славова, **В. Димова**, В. Гайдарска. 2011. Икономическа ефективност на преработката на краве и овче мляко, произведено във фермите на ОСЗЖ-Смолян. *Животновъдни науки*, 48 (3): 16-19, ISSN 0514-7441

Abstract. The economic efficiency of the processing cow and sheep milk produced in their own cattle and sheep farm in OSZJ - Smolyan was analyzed. Object of the survey is manufacturing of dairy products in the workshop for processing milk in OSZJ - Smolyan. It produced fresh cow's milk, cow and sheep's yogurt and cow's butter. Raw material production - sheep and cow's milk is harvested at their cattle and sheep farm. It was found that under the conditions of functioning and financing of cattle and sheep farms, also workshops for processing milk OSZJ - Smolyan is cost-effective production of fresh cow's milk, sheep and cow's yogurt and cow's butter through the processing milk obtained from cows of the Bulgarian Rhodopy cattle and sheep from Karakachan breeds livestock in their farms.

Keywords: milk, incomes, rate of profitability, cow, sheep

4. Penev T., Ch. Miteva, **V. Dimova**, R. Roydev, J. Mitev, Z. Manolov. 2013. Assessing frictional properties of rubber floors in free housing systems for dairy cows. *Trakia Journal of Science*, Vol. 11, No 2: 197-204, ISSN 1313-7050 (Biomedical Sciences)

Abstract. The investigation was conducted in a dairy cow free-stall barn. The resting area of was in individual cubicles, and walking alleys were covered with two types of rubber mats – with and without abrasion lining. An electric scraper system was used for manure cleaning, and cows were received a total mix ration ad libitum. The coefficients of static and dynamic friction of both rubber mat types when dry, wet or covered with manure were compared. It was established that static and dynamic coefficients of friction of dry rubber mats without abrasion lining were very good. Wetting reduced the frictional properties of this type of flooring. The measured static and dynamic coefficients of friction - $\mu = 0.44$ and $\mu = 0.41$ respectively, indicated a good contact between the non-abrasive rubber mat and hooves and no significant risk from slipping. The manure spilled on this flooring type compromised considerably the cohesion between hooves and rubber mat, and the measured static and dynamic coefficient of friction ($\mu = 0.4$) indicated poor cohesion, and risk from slipping and falling of cows. The dry rubber mat with abrasive lining exhibited very high static ($\mu = 0.59$) and dynamic ($\mu = 0.56$) coefficients of friction. Wetting of these rubber mats resulted in slightly higher static friction ($\mu = 0.61$), and lower dynamic friction ($\mu = 0.52$). The presence of manure mass on the abrasive flooring reduced substantially ($P < 0.05$) static ($\mu = 0.49$) and dynamic ($\mu = 0.46$) coefficients of friction. Nevertheless, manure spilled on rubber mats with abrasive lining provided an optimal coefficient of friction, but possibly diminished their primary purpose, i.e. claw horn abrasion.

Keywords: rubber mats, claw horn, static friction, dynamic friction

5. **Dimova V.**, D. Georgiev, S. Petkova. 2018. Management of the construction waste in reconstruction of a cattle-breeding building. *Bulgarian Journal of Animal Husbandry*, Agricultural Academy, LV, Vol. 55, No 1: 64-75, ISSN 0514-7441 (Print), ISSN 2534-9856 (Online). https://animalscience-bg.org/page/bg/details.php?article_id=463

Abstract. The purpose of the study was to make a forecast for the management of the construction waste, generated by the reconstruction and technological modernization of an existing dairy cow building. An option for free rearing of 94 cows in individual cubicles was developed, suitable for modernization of the technological processes in an existing building for a tied up rearing of 73 cows. The quantities of different construction waste were determined during the reconstruction and a forecast sheet was prepared for their management. It was been established that there were 61.2% (113.6 m³) “not dangerous” and 38.8% (72.0 m³) “dangerous” wastes, classified as such according to the ordinances. Some “dangerous” wastes are suitable for re-use under the conditions of a cattle-breeding farm (an object of unpleasant gas separation). These are: concrete for reinforced concrete flooring – 29.5 t (utilization 100%); concrete from feed manger - 37.5 t (utilization 100%); floor bricks – 10.0 t (utilization 50%); profile steel – 2.4 t (utilization 90%). According to the forecast for the construction waste generated during the reconstruction of the building, the degree of their physical utilization is 66.5% – by 11.5% higher than the normative requirement for the period 2017-2018 (55%).

Keywords: dairy free-stall, tie-stall, reconstruction and technological modernization, construction waste, management

6. **Dimova V.**, K. Peychev, D. Georgiev. 2018. Comparative analysis of certain technical, technological and environmental parameters of exposed reinforced concrete lagoons for liquid cattle manure. *Bulgarian Journal of Animal Husbandry*, Agricultural Academy, LV, Vol. 55, No 3: 50-60. ISSN 0514-7441 (Print), ISSN 2534-9856 (Online). https://animalscience-bg.org/page/bg/details.php?article_id=481

Abstract. The aim of the present study was to provide a comparative analysis on some technical and environmental indicators for a variant of a “lagoon” fertilizer storage facility for liquid manure from a cow farm with a capacity of up to 150 dairy cows. Three variants of an open-pit reinforced concrete lagoon with the same volume (1303.6 m³) and depth (4.00 m) were developed: a rectangular lagoon and vertical walls; a rectangular lagoon and sloping walls and a lagoon with a round outline. It was found that the largest manure contact area and supposedly the highest level of emissions was the rectangular lagoon with sloping walls (387.6 m²). The area is about 19% larger than the round lagoon (325.9 m²) and the rectangular lagoon with vertical walls (326.4 m²). All the developed options are applicable for storage of liquid manure from the farm with small differences in the relative costs of reinforcing steel (5.5-6.8%), profile steel (1.2-4.9%) and concrete (3.4%). The most economical in terms of cost of building materials are the round lagoon and the rectangular lagoon with sloping walls. In event of compromising the insulation membrane, the smallest risk of soil contamination exists in the rectangular lagoon with sloping walls, with a total area of 603.1 m². The risk increases by 3.7% in the round lagoon (625.6 m²) and by 14.8% in the rectangular lagoon with vertical walls (692.5 m²). In view of the small differences in the cost of materials for the construction of dug-out reinforced concrete lagoons with different outlines and the severity of their ecological impact (release of emissions through the contact area “manure-air”), it is advisable to store liquid manure in free-box farming farms of a basic herd of up to 150 dairy cows to use a round lagoon.

Keywords: dairy free-stall, technical, technological and environmental parameters, liquid manure, lagoon-type manure storages from reinforced concrete

7. Georgiev D., V. Dimova, K. Peychev, G. Dineva. 2020. Express assessment of some building parameters in milking parlors for cows. *Bulgarian Journal of Agricultural Science*, 26 (Suppl. 1): 208-211, **SJR=0.248/2020**, ISSN 1310-0351, ISSN 2534-983X.
https://journal.agrojournal.org/page/en/details.php?article_id=3146

Abstract. The analysis of the construction and planning parameters of milking parlor with different capacity and configuring the animals on the milking platforms was carried out. The studies are complemented by an assessment of the construction parameters in different variants of the input - output traffic of the animals to the milking parlor. The subject of the analysis is to determine the quantity for the different variants of the situation. On this basis, regression equations for express estimation of the change of the basic building materials (concrete and reinforcing steel) with changing the capacity of the milking parlor are derived. The equations are universal and could be used extensively to initially estimate the intrinsic the basic building materials (concrete and reinforcing steel) in the construction of the floor profile.

Keywords: express estimation, milking parlor, planning parameters, regression equations

8. Dimova V., D. Georgiev, R. Georgiev, S. Grigorov. 2020. Design of an energy efficient building equipped with air conditioning system for growing "Kladnitsa" mushrooms. *Bulgarian Journal of Agricultural Science*, 26 (Suppl. 1): 221-228, **SJR 0.248/2020**, ISSN 1310-0351, ISSN 2534-983X.
https://journal.agrojournal.org/page/en/details.php?article_id=3149

Abstract. The purpose of the study is to create appropriate technological parameters in a building for intensive year-round cultivation of “Kladnitsa” mushroom by air-conditioning the room. To achieve this goal, an original energy efficient building was developed, consisting of a lightweight type of glasshouse with a reinforced concrete floor and a steel supporting structure. The mushrooms are grown in polyethylene bags on 4 pieces of three-storey metal racks all year-round. Based on the research, a HVAC (heating-ventilation-air-conditioning) system for year-round maintenance of the microclimate in the mushroom facility was proposed and developed. The obtained results show that the selected building materials are suitable for a year-round intensive cultivation of “Kladnitsa” mushroom. It allows successful air conditioning in the year-round. Its cooling in the summer is possible and

economically feasible to be done with groundwater with $t_{gw}=10-12^{\circ}\text{C}$. Known deviations of 3°C from the optimum internal temperature are observed on hotter days. Higher heat and cooling loads during the cultivation are in the fruiting phase, so it is recommended that the sizing of the equipment be carried out at this phase. Evaporative cooling of the room by spraying water is successful, because it simultaneously lowers the temperature and increases the humidity. Third heat exchanger is also recommended (in the part of the general circulating air), which in the case of insufficient heat influxes from the outside, to raise the temperature of the treated air sufficiently to reach the recommended microclimatic parameters in the room.

Keywords: glasshouse, heating-ventilation-air-conditioning, microclimate, technological parameters

9. **Dimova V., D. Georgiev.** 2021. Optimizing the thickness of a straw outer wall of a building for sows in a view to achieving cost-effective heat insulation. *Agricultural science and technology*, An International Journal, Published by Faculty of Agriculture, Trakia University, Stara Zagora, Bulgaria, Vol. 13, No 2: 167-175. ISSN 1313-8820, ISSN 1314-412X. DOI:10.15547/ast.2021.02.028

Abstract. The aim of the study is to determine the optimum thickness of the surrounding wall structure of a building for nursing sows by using heat insulation from straw and different fuel (pellets and dry wood) for heating the building. To achieve the purpose, 6 models of walls made of environmentally friendly panels with wooden skeleton, thermal insulation from pressed straw bales and double-sided clay plaster have been developed, such that the accepted thickness of the thermal insulation layer is respectively: 20, 25, 30, 35, 40 and 45 cm. The construction value of the finished wall is determined by adding the value of the construction and assembly works on the construction site to the value of the preparation of the panels (in a workshop), including the payment of labor, materials and additional costs for the implementation of clay plaster and waterproofing membrane. The annual energy losses through 1 m² of the enclosing wall and the annual heat insulation costs (as a sum of annual energy cost and the depreciation deductions) are determined through the described methodology and verification of condensation of water vapor on the inner surface of the wall was carried out. The results of the research show that by using pellets for fuel, the optimal thickness of the thermal insulation is 45 cm, and by using dry wood it is 35, 40 and 45 cm. All studied models of enclosing straw wall meet the hygienic requirements for preventing condensation on their inner surfaces.

Keywords: annual costs, energy losses, dry wood, heat insulation, nursing sows, pellets

10. **Dimova V.** 2022. Assessment of the impact of the costs of building the floor profile on the technological flexibility of four-row buildings for free-box breeding of cows. *Agricultural science and technology*, An International Journal, Published by Faculty of Agriculture, Trakia University, Stara Zagora, Bulgaria, Vol. 14, No 2: 81-94, ISSN 1313-8820, ISSN 1314-412X DOI: 10.15547/ast.2022.02.023

Abstract. 20 popular technical-technological schemes of semi-open four-row buildings for dairy cows with widths in the range 20.60 - 31.00 m are analyzed. The options are grouped according to the internal distribution of the buildings. Their technological flexibility has been determined and a preferred range of widths with a maximum has been outlined. For the individual studied options the costs for the technological profile of the floor (including the stationary equipment) have been calculated, as the construction costs for the construction of the zero cycle, the bearing and enclosing constructions of the building are excluded. For each preferred width, the material consumption of the floor profile was assessed according to the construction indicators: consumption of concrete and steel (reinforcement - for reinforced concrete pavement and profile - for technological equipment), related to 1 m² of built-up area and one slaughterhouse. A methodology for qualitative assessment of technological flexibility has been developed, taking into account the impact of these costs. It is established that the buildings with widths in the range 25.20-25.40 m have the greatest technological flexibility. Buildings with widths in the ranges 23.20-25.20 m and 25.80-28.00 m with equal

flexibility also have very good indicators. According to the developed methodology, the widths with the same technological flexibility differ in the assessment of the impact of the costs for the floor profile - to a greater extent for larger width ranges. The buildings with widths of 25.20 m and 25.40 m with maximum technological flexibility are practically equivalent, and the differences in estimates taking into account the impact of total costs of concrete and steel per 1 m² built-up area of the floor at widths 23.20 m, 25.80 m and 28.00 m are 2.1 - 4.0%. For the same widths, the estimates, taking into account the impact of the total cost of concrete and steel for one cattle ranch, are from 6.5 to 15.9%. The developed methodology is recommended for the practice for assessing the impact of the costs of the floor profile on the technological flexibility of buildings for free-box breeding of high-capacity cows. Of the four-row buildings, those with widths in the range 25.20-25.40 m and width 23.20 m are recommended.

Keywords: four-row buildings, dairy cows, technologically necessary width, technological flexibility, technological profile of the floor, consumption of concrete and steel, assessment

Г.8	Научни публикации в нереферирани списания с научно рецензиране или в редактирани колективни томове (За самостоятелна научна публикация се зачитат 20 точки. За научна публикация в съавторство се зачитат 20/n точки, или разпределени в съотношение на базата на протокол за приноса)
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1. Димова В., Й. Попова, Д. Динев. 2010. Влияние на технологичните параметри върху някои технико-икономически показатели при различни начини за отглеждане на женски телета за разплод, *20th Anniversary International Scientific Conference, 3th-4th June 2010*, Stara Zagora, Bulgaria, Vol. VII: Technical studies, 80-90, ISBN 978-954-9329-46-9 XX. Форма на публикуване: CD/DVD

Abstract. The objective of the study is to find out the effect of the technological parameters on the relative built-up area and consumptions of the basic construction materials (concrete and steel) for the construction of the technological profile of the floor in buildings with different methods for rearing of female breeding calves. A total 8 technical and technological variants for free rearing of female breeding cattle in farms with capacity of 40, 60, 80 and 100 cows have been worked out: 4 - with group cubicles on sloping floor (for 3 - 18 month's calves) and with landings type "Butterfly" (for heifers) and 4 - with group cubicles on a straw bedding. It has been established that the technological parameters exert an influence on the total relative built-up areas and consumptions of materials for the construction of the technological profile of the floor:

- by the variants with sloping floor and with landings type "Butterfly": zone for rest - with 32-33% (built-up area), with 27-33% (concrete), with 19% (reinforcement steel), with 46-54% (profile steel); zone for forage allocation - with 32%, 33-39%, 38-46%, 6-8% respectively; zone for movement - with 32-33%, 33-34%, 35-43%, 38-48% respectively.
- by the variants with straw bedding: zone for rest - with 32-33% built-up area), with 28-34% (concrete), with 33-34% (reinforcement steel), with 27-31% (profile steel); zone for forage allocation - with 35%, 35-39%, 34%, 6-8% respectively; zone for movement - with 29-30%, 31-33%, 32-33%, 61-66% respectively.

Keywords: buildings, calves, heifers, technical and technological parameters, technological profile of the floor

2. Miteva Tch., V. Dimova, A. Iliev, Zh. Gergovska, J. Mitev, K. Uzunova. 2011. Integrated hygiene Assessment of Dairy Farms of different Capacity. *Science and Technologies*, Vol. 1., No 5: Veterinary medicine, Animal studies: 136-146. ISSN 1314-4111 (Online).
<http://www.sustz.com/bg/?f=journal&number=5>

Abstract. The purpose of this study was to evaluate the hygiene parameters in dairy farms of different capacities and technological solutions and to find out to what extent the established values corresponded to

those set out in regulations. Subjects of estimation were 6 dairy farms divided into three groups depending on their capacity – 1st group: over 50 dairy cows; 2nd group: from 10 to 50 dairy cows and 3rd group: up to 10 dairy cows. The farms were situated in the village Yastrebovo, region of Stara Zagora. The main problems in assessing the overall condition of the farms included a lack of disinfection sites, lack of sanitary facilities, lack of manure depots, lack of isolation and quarantine facility, and non-systematized, incomplete or missing documentation and reporting, lack of an action plan in extreme situations. The existing practices in the investigated farms were risky and a prerequisite for environmental pollution. There was no action to limit the odour of manure, to reduce exhaust emissions of greenhouse gases in the atmosphere and to monitor the uncontrolled leakage of slurry and sewage in the soil. After completing all control charts and analyzing responses to questions, the final result of the integrated hygiene assessment of the farm was negative.

Keywords: integrated hygiene estimation, dairy farms, check lists

3. **Димова В.**, Ю. Митев, Ч. Митева, Й. Попова, К. Узунова, 2012. Реконструкция на сграда за вързано отглеждане на крави с оглед подобряване на някои зоохигиенни показатели. Научно списание за селскостопанска и горска наука *Екология и бъдеще*, Vol. XI, No 1: 41-47, ISSN 1312-0751

Abstract. The aim of this study is to develop the technological decision for reconstruction and modernization of the real existing building for tied rearing of 50 dairy cows with intention to improve some of the important animal hygiene parameters. Two technical-technological variants of cows' rearing are compared. It was established that developed decision of tied rearing of 50 dairy cows, with 2 rows of cubicles, central feeding alley and manure cleaning system using tractor with bulldozer shovel allow animals better comfort than the other variant and assure 63.1 % bigger build up area, 2.6 times bigger build up volume and the required by regulations coefficient of natural light in buildings. The developed decision provides suitable and comfort conditions for rearing of animals and that decision is appropriate for modernization of other dairy farms in Bulgaria with capacity of 50 dairy cows.

Keywords: reconstruction, farm buildings, dairy cows, animal hygiene

4. Митева Ч., Ю. Митев, Ж. Герговска, Р. Славов, Н. Василев, Т. Пенев, **В. Димова**, К. Узунова, Р. Отузбиров. 2012. Поява и развитие на консултантските служби в земеделието по света. *Селскостопанска наука*, 45, 2: 3-14, ISSN 1311-3534

Abstract. The term “extension service” contains within itself an explanation for publicly funded, non-formal educational structure with research resources and self-organization. The mission of this structure is associated with the provision of relevant and useful information about the older generation of a different nature. This is a significant social innovation, having important implications for agricultural development. It is created and recreated, adapted and developed over the centuries. The analysis of survey sources indicates that the development of extension services is directly related to increasing the efficiency of agricultural production through the promotion of professional knowledge among farmers. These structures are organized and financed in different ways, but meet the same objectives - support and service to farmers to increase production results, qualification and knowledge of farmers and improve the living standards of farmers.

Keywords: extension service, development, history, agriculture

5. Miteva Tch., G. Kostadinova, S. Laleva, P. Slavova, Y. Staykov, V. Katsarov, **V. Dimova**, K. Uzunova, 2012. Protoform of the modern extension service in the field of animal husbandry and veterinary medicine. III. The period after the Liberation of Bulgaria (period of national progress in agriculture), *Science and Technology*, Vol. 2, No 5: Veterinary medicine, Animal studies: 59-67, ISSN 1314-4111 (Online).
<http://www.sustz.com/journal/VolumeII/Number5/Papers/TchonkaMiteva1.pdf>

Abstract. The present research analyses the activities of state, public and private structures assisting the work of agriculture producers after the Liberation of Bulgaria (aka period of national progress in agriculture), and throws light on their role as a protoform of the modern extension service in the field of animal husbandry and veterinary medicine from historical point of view. For this purpose, a number of governmental documents (orders, laws, ordinances etc.), rules for organisation of agricultural schools, programmes of public organisations and unions, museum and library funds expositions relevant to the study's goal were investigated. The period of national progress in agriculture in Bulgaria is associated with the foundation of different types of agricultural schools and training courses. The organisation of agricultural experimental stations and the implementation of professional training have improved the practical skills of people engaged in farm animal rearing. The foundation of livestock husbandry unions and social movements, the educational activities related to improving the knowledge and skills of livestock producers became more pragmatic and species-specific. During that period, due to the direct transition of Bulgaria to bourgeois capitalist development, agricultural educational and administrative structures organised and institutionalised in the country were similar to those of West Europe. This way, agricultural teachers, practicing agronomists, veterinarians and zootechnicians, specialists and administrative staff hired by livestock husbandry unions became the founders and distributors of scientific and applied knowledge in the field of animal and veterinary medical sciences. The training of livestock producers in the country performed by them at that time is a kind of a protoform of the modern extension service.

Keywords: extension service, proto-form, animal science, veterinary medicine

6. Митева Ч., Ж. Герговска, **В. Димова**, Ю. Митев, К. Узунова, Г. Костадинова, Т. Пенев. 2012. Начини за подобряване охлаждането на лактиращи крави и тяхното приложение у нас. *Science and Technology*, Vol. 2, No 5: Veterinary medicine, Animal studies: 68-72, ISSN 1314-4111 (Online).
<http://www.sustz.com/journal/VolumeII/Number5/Papers/TchonkaMiteva2.pdf>

Abstract. In cattle practice more widely used various methods for additional cooling of the air in livestock buildings to eliminate the harmful effects of high temperatures on the dairy cows. To optimize the temperature and humidity conditions in livestock buildings in summer successfully are applying different combinations of fans and sprinklers, evaporative cooling, reducing the direct effect of solar radiation, providing a sufficient amount of cold, fresh water etc. Places to implement these cooling facilities are including both animal buildings and parlors. Gradually these practices are introducing in dairy farms in the country, mainly in larger farms and from farmers who are highly motivated to continue working in this agricultural sector.

Keywords: additional cooling, fans, sprinklers, sprayers, dairy cows

7. Герговска, Ж., Ч. Митева, Т. Пенев, **В. Димова**, Ю. Митев, 2012. Оценка на комфорта при свободно отглеждане на крави за мляко: I. Функционални активности на лактиращи крави в зависимост от параметрите на индивидуалните боксове, *Екология и бъдеще*, Vol. XI, No 4: 64-68, ISSN 1312-0751

Abstract. The aim of present study was to establish some functional activities of lactating cows, depending on the parameters of individual cubicles in order to provide better comfort for their rearing. The study was done in four dairy cattle farms, free stall rearing in individual cubicles. The study includes only lactating cows from each farm. The measured parameters of cubicles include width, length, distance to neck rail from the back board of cubicle, distance to neck rail from the bedding surface and used bedding materials in the cubicles. Determined functional activities of lactating cows include: number of cows lying, number of cows stands with four or two legs, number of cows that eating. The best results of functional activities were observed for lactating cows on a farm set D, namely, the highest percentage for the lying in cubicles cows (55.71%) and the lowest percentage of cows, standing in the cubicles (10.84%). The highest percentage of cows standing on

technological alleys, i.e. not in cubicles and facing the manger is set on a farm A (29.66%), followed by farm B (23.04%). Reliably influence of the calendar month on the functional activity of lactating cows was not observed.

Keywords: freestall barns, cubicles dimensions, comfort, functional activities, dairy cows

8. Митева, Ч., Ж. Герговска, Т. Пенев, Ю. Митев, **В. Димова**, 2012. Оценка на комфорта при свободно отглеждане на крави за мляко: II. Индекси на комфорта на индивидуални боксове за лактиращи крави, *Екология и бъдеще*, Vol. XI, No 4: 69-77, ISSN 1312-0751

Abstract. The aim of this study was to evaluate the comfort of individual cubicles in dairy farms using the indices, related to cow comfort - cow comfort index (CCI), stall standing index (SSI), stall usage index (SUI). The study was done in four dairy cattle farms, free stall rearing in individual cubicles. The study includes only lactating cows from each farm. In considering the effects of individual components of cubicles on the values of the indices was used single factor ANOVA, because the differences are not strictly differentiated by farms for individual variations in cubicles. In every dairy farm were accounted the number of cows with different degree of soft tissue fraying on the hocks and necks. Distance to the neck rail from the back board of cubicle and its height from the bedding surface have a reliable effect on the values of the indices and cow comfort and the use of cubicles, but not on the stall standing index. Reliably influence of the width of the cubicle on three indices of comfort was not established, while the type of used bedding reliably affects the value of the three indices. The highest percentage of abrasions and wounds on the hocks are reported in cubicles with rubber mats (53.15%) followed by those with a concrete surface and straw bedding (34.12 to 38.00%) and least in the cubicles with manure and straw (11.46%). The lowest percentage of cows with lesions on the neck (9%) occurred on the farm with the lowest placed neck rail (105 cm), followed (11.46%) of the farm with located neck rail at the highest height (130 cm). Best values of the three indices were establish for farm D, respectively CCI – 83.14%, SUI – 68.85% and SSI 10.84%, but the same farm has the highest percentage of abrasions and wounds on the hocks (53, 15%) and neck of the animals (13.5%). Farm B has a relatively best combination of values of the three indices (CCI – 68.04%, SUI – 45.43% and SSI – 12.24%) and the lowest percentage of cows with abrasions and wounds on the hock (11.46%) and the neck of the animals (10.42%).

Keywords: cow comfort index (CCI), stall standing index (SSI), stall usage index (SUI), cubicles, dairy cows

9. Popova, Y., **V. Dimova**, Tch. Miteva, Zh. Gergovska, K. Uzunova, T. Penev, 2012. Economic Efficacy of Manure Cleaning and Storage Systems at Dairy Cattle Farms, *Ecology and Future*, Bulgarian Journal of Ecological Science, Vol. XI, (4): 45-48, ISSN 1312-0751

Abstract. An analysis of economic efficacy of two cattle rearing systems using different manure cleaning and storage approaches – solid manure cleaning with storage on a manure pad, and liquid manure cleaning with storage in a steel-reinforced concrete lagoon was performed. The present study was performed in two semi-open cattle barns with capacity of 108 and 120 cows and respective number of calves and heifers. Two manure cleaning and storage systems were used: variant A (building for 108 cows, liquid manure cleaning system using an electric scrape, 4-month storage of previously diluted with water and homogenized manure into a lagoontype manure tank) and variant B (building for 120 cows, solid manure cleaning system using a tractor with bulldozer shovel and storage on a pad with three walks for 6 months). The feed was dispensed using a mixer. The cows were milked in a 2 x 5 herring-bone type milking parlour. The animals were housed in free stalls. The rough and voluminous feeds are self-produced, whereas concentrate feed were purchased. The feeding was compliant to the productivity (average milk yield 6500 l, 90% fertility rate), the physiological state and age of cows. The replacement of the herd was performed with heifers from the same farm. Income and production costs were calculated using prices actual by the time the research was conducted. It was established that the investment costs per cow related to building a cattle farm with liquid manure management system (variant A) were by 24.89% higher as compared to respective costs per cow at a farm with solid

manure management system (variant B), and production costs per cow were by 10% higher at farm A compared to farm B. The economic efficacy of production at farms with solid manure management system was 37% vs 24.18% at farms with liquid manure management.

Keywords: cow, incomes, rate of profitability, slurry and solid manure

10. Попова Й., С. Лалева, П. Славова, **В. Димова**. 2013. Икономическа ефективност на отглеждането на специализирани породи говеда за мляко в планинските и полупланински региони на България, *Science and Technology*, Vol. 3, No 5: Veterinary medicine, Animal studies: 82-85, ISSN 1314-4111 (Online).
<http://www.sustz.com/journal/VolumeIII/Number5/Papers/YovkaPopova2.pdf>

Abstract. The purpose of the following study is to analyze the economic efficiency of breeding cattle breeds for milk in the mountains and hilly regions of Bulgaria. The study was conducted in a farm with 30 black-and-white cows and the relevant categories calves and heifers. There is an average annual milk yield of 5000 kg with 3.6% Fat, 90% fertility and 20% repair of the herd. Semi-production system has been applied - the animals have been raised in a stall-pasture conditions in a closed building with adjoining small yards and mechanized operations - feeding, milking, cleaning and watering. Part of the female and all male calves were sold until they became 90 days old. The income and expenses are estimated at current prices in 2012. It was establish that: as a result of the study held we can make the following conclusion - breeding of cattle breeds for milk in the mountains and hilly regions does not have the expected economic effect – the profit and rate of return are low.

Keywords: cow, farm, incomes, costs, profit

11. Герговска Ж., **В. Димова**, К. Пейчев. 2013. Иновации и развитие на говедовъдството. *Научна конференция с международно участие “Иновации и развитие на земеделието в България”*, 16-17 май 2013, Тракийски университет, Аграрен факултет, Издателство: Алфамаркет Плюс, Стара Загора, 21-35, ISBN 978-954-9443-66-0

Резюме. Присъединяването на България към ЕС изправи аграрния сектор (в частност говедовъдството) пред нови предизвикателства: обща селскостопанска политика (ОСП), общ пазар, общи правила и стандарти, силна конкурентна среда, разширен достъп на българските производители до пазара на ЕС, както и навлизането на съвременна техника и технологии. Млечното говедовъдство се изправи пред сериозни проблеми поради недобрата си структура към периода на присъединяване, дребния характер на производство, лошата материално-техническа база и липсата на интегрирани институции, които икономически и политически да обезпечат по-нататъшното му развитие. През периода 2007-2011 г. се наблюдава процес на окрупняване на говедовъдните ферми у нас за сметка на рязко намаляване на общия брой ферми и на тези, отглеждащи до 9 крави. Докато през 2007 г. в стопанствата със 100 и повече крави се отглеждат 8% от кравите за мляко, през 2011 г. в тях вече се отглеждат над 14%. Независимо от повишената инвестиционна активност в аграрния сектор, технологичното равнище на производство у нас остава ниско. Европейският опит показва, че иновационната политика е мощно средство за преодоляване изоставането в селското стопанство. Основните направления на иновации в млечното говедовъдство могат да се насочат в три групи - иновационни технологични решения в сградостроителството, използваната техника за доене и обслужване на животните и отделни иновационни елементи, целящи подобряване благополучието на животните. В България през последните години значително нарасна делът на фермите, в които се внедриха доилни зали с много висока степен на механизация на производствените процеси и опции за пълна автоматизация за обработка и архивиране на оперативната информация касаеща доенето, селекцията, храненето и ветеринарното обслужване на животните. Търсят се решения на ограждащи конструкции на сградите,

отговарящи на изискванията за повишена енергийна ефективност в съответствие с европейските директиви и практики.

Ключови думи: говедовъдни ферми, окрупняване, европейски опит, иновационни технологични решения, производствени процеси, доене, автоматизация, енергийна ефективност

12. Георгиев Р., К. Пейчев, В. Димова. 2013. Иновации в областта на енергийната ефективност и възобновяемите източници на енергия. *Научна конференция с международно участие "Иновации и развитие на земеделието в България"*, 16-17 май 2013, Тракийски университет, Аграрен факултет, Издателство: Алфамаркет Плюс, Стара Загора: 119-127. ISBN 978-954-9443-66-0

Резюме. През последните 10-15 години националната ни енергийна политика е посветена на енергийната ефективност в различни сфери на енергопотреблението и развитието на възобновяемите и алтернативните източници на енергия. Основната цел е намаляване на енергийната интензивност и въвеждане на иновации при използване на възобновяемите енергийни източници. Новите тенденции в строителството се изразяват в постигането на енергоикономични отопляеми животновъдни сгради с повишена топлоизолационна способност на ограждащите конструкции и проектирани по принципите на строителната физика така, че с по-малко количество топлина да се осигуряват нормативните параметри на микроклимата в помещенията. Съвременните топлоизолационни материали са екологично чисти продукти, разработени за бързо и лесно полагане и издръжливи във времето. Някои от тях са експандираният пенополистирол (EPS), екструдираният пенополистирол (XPS), каменната вата, най-новите материали - целулозна изолация, вакуумни изолационни панели (VIP) и др. Ново решение е топлоизолационен продукт, разработен на база на класическия полистирен и съдържащ специфични графитни частици, които отразяват топлинното излъчване като огледало и намаляват загубата на топлина в помещенията. Налице са нови аспекти в директното използване на биомаса за гориво (приоритет на технологиите за чипсиране на дървесина и дървесни отпадъци, използване на дървесен чипс за пиролизно генериране на въглеродно газова смес). Иновации от технологичен, но и от глобален характер навлизат в производството на биогаз - на биогазовите инсталации започва да се гледа като на енергийна алтернатива на конвенционалната електроенергетика (ТЕЦ и АЕЦ), особено в аспекта на безопасността и екологията. Развиват се иновативни решения във фотоволтаичната и ветровата енергетики.

Ключови думи: отопляеми животновъдни сгради, енергийна ефективност, топлоизолация, ограждащи конструкции, биомаса, гориво, биогаз, фотоволтаична и ветровата енергетики

13. Uzunova K., K. Stamatova-Yovcheva, V. Dimova, D. Yovchev, M. Halil. 2014. Anatomical and Ethological Changes in Poultry Affected by Osteopetrosis. *Scientific Papers: Animal Science and Biotechnologies*, Publisher: Agroprint Timisoara, Romania, 47 (1): 188-191. ISSN 1841-9364 (Print), 2344-4576 (Online).
<http://spasb.ro/index.php/spasb/article/view/1675>

Abstract. An integral veterinary hygiene survey in a farm rearing stock layers, 4 months of age, has been performed to throw light on the unknown etiology of sporadic osteopetrosis outbreaks. Observations (ethological and anatomical) were conducted to evidence the development of the disease. The welfare of affected birds was assessed as poor after detailed analysis of all elements of housing environment. This was the cause for the development of the severe illness regardless of the fact that birds were preliminary vaccinated.

Keywords: anatomical and ethological changes, osteopetrosis, poultry, welfare

14. Penev T., Z. Manolov, D. Dimov, V. Kirov, K. Uzunova, **V. Dimova**, V. Radev. 2014. Investigation of some hoof disease prevention practices on claw horn hardness and frictional properties in dairy cattle. *Science and Technology*, Vol. 4, No 5: Veterinary medicine, Animal studies: 63-73, ISSN 1314-4111 (Online)
<http://www.sustz.com/journal/VolumeIV/Number5/Papers/TonchoPenev1.pdf>

Abstract. The purpose of the present research was to investigate the influence of some hoof care practices in dairy cattle (trimming and baths with disinfection solutions) on claw horn hardness and cohesion with concrete floor. Trimmed hooves exhibited reduction in sole horn hardness from 92.75 to 85.125 Shore A, whereas heel horn hardness decreased from 81.75 to 80.375 Shore A. On the other hand, this resulted in increased coefficients of static and dynamic friction from 0.61 to 0.63, and 0.5 to 0.55, respectively, indicating the trimming of hooves increased the walking and stepping safety of cows. The treatment of hooves with 5% disinfection solutions resulted in highest increase in the hardness of all studied hoof zones (walls, soles and heels) after formalin bath, followed by sodium chloride. The 5% solutions of copper and zinc sulfate had a less significant effect on claw horn hardness. The higher concentrations of disinfection solutions resulted in even greater increase in hardness, with highest values after formalin baths again. The treatment with copper sulfate did not exhibit a linear trend in hardness increase although by the end of the study hardness values were higher than initial ones. The increased hardness is essential for coefficients of static and dynamic friction, with evidence for negative correlation between these parameters. The hardness of soles and heels played a significant role for friction coefficient values, as the stability during locomotion depended mainly on the horn quality in these hoof areas.

Keywords: dairy cows, hardness, claw horn, trimming, disinfection solutions, cohesion

Abbreviations used: sodium chloride (NaCl), copper sulfate (CuSO₄), zinc sulfate (ZnSO₄)

15. Georgiev R., K. Peichev, **V. Dimova**, G. Dineva, I. Binev. 2015. Optimization of Thermal Insulation of Underfloor Heating in Weaning Pigs. *Current Trends of Technology and Sciences*, Vol. 04 (02): 498-500, ISSN: 2279-0535

Abstract. A pig-shed with under floor heating is considered. Heating was implemented by a heating coil embedded in the floor. Polyurethane foam (XPS) was placed under the heating coil to reduce heat losses. The method of heat balance was used to study annual operating costs for heating of the building at different thickness of the thermal insulation under the coil. Data have been obtained for annual consumption of different types of fuel – wood pellets, coal and natural gas needed for heating. Thermal insulation of thickness 8-10 cm was found as suitable and cost effective for an operating period of 20 years. Smaller thickness would result in higher and non cost effective energy costs.

Keywords: thermal insulation, underfloor heating, pig-shed, optimization, energy consumption

16. Georgiev D., K. Peychev, **V. Dimova**, R. Georgiev, K. Uzunova, V. Stoyanova, M. Tosheska. 2016. Analysis of Costs for Construction of Milking Parlours of Various Designs. Agricultural University of Tirana. *Albanian Journal of Agricultural Science*, 15(1): 54-64, ISSN 2218-2020 (*Разделителен протокол* - Dimitar Georgiev - 50%; Kancho Peychev - 10%; **Vanya Dimova** - 10%; Rashko Georgiev - 10%; Krasimira Uzunova - 10%; Vanya Stoyanova - 5%; Marina Tosheska - 5%)

Abstract. Analysis of construction costs of milking parlours of various capacities and arrangement of animals on milking platforms was done. The studies included also an evaluation of construction parameters of different variants of cow traffic into and from the milking room. The analysis evaluated the costs for concrete and reinforced steel for the different designs. Regression analysis of construction and planning costs was made for the specific models. The conclusions are focused on minimization of costs for construction of milking

parlours with preliminary set of technological parameters. The parlour capacity influenced proportionally the absolute amounts of reinforced steel and concrete for construction of the technological profile of all studied herringbone milking parlours design variants. The arrangement of cows in the herringbone parlours with identical capacity had an effect on the relative amounts of reinforced steel and concrete. The location of the entry to milking platforms influence the amount of steel and concrete spent for the technological profile of the parlour floor for all observed variants.

Keywords: milking parlours, planning parameters, construction and planning costs, technological conditions

17. Halil M., T. Penev, D. Kanakov, **V. Dimova**, N. Nikolova. 2016. Occurrence of Psychosis in Dogs Reared in House, Farm and Kennels. *Scientific Papers: Animal Science and Biotechnologies*, Publisher: Agroprint Timisoara, Romania, 49 (1): 152-158 (Romania). ISSN 1841-9364 (Print), 2344-4576 (Online). <http://www.spasb.ro/index.php/spasb/article/view/2140>

Abstract. This ethological study was carried out to establish the occurrence of psychosis in dogs, reared both in-home (as a pet) and in dog kennels. The dogs housed in kennels were reared either individually (as working animals) or in groups (in kennels). All the pet dogs were reared alone in the households. The highest occurrence of psychotic states was encountered in stray dogs housed in kennels and followed by the pet dogs. These states were very rarely observed in individually reared dogs at farms and working dogs. The possible explanation is that they were submitted to less stressors due to good management at farms and the proper approach on the basis of their temperaments, i.e. their welfare was at the highest level.

Keywords: disease occurrence, kennel, pet dogs, psychosis, stressors.

18. Uzunova K., M. Halil, **V. Dimova**, T. Penev, G. Nikolova. 2016. Ethological Model for Diagnosis of Infectious Encephalomyelitis in Broiler Chickens. *Scientific Papers: Animal Science and Biotechnologies*, Publisher: Agroprint Timisoara, Romania 49 (1): 159-162. ISSN 1841-9364 (Print), ISSN 2344-4576 (Online). <http://www.spasb.ro/index.php/spasb/article/view/2109>

Abstract. The purpose of the study was to establish the specific symptomatic ethological pathognomonic complex of infectious encephalomyelitis in poultry. The behavioural changes were monitored in 2-week-old broiler chickens (total number 10,500 housed in three premises). The typical pathoethological manifestations of infectious encephalomyelitis were investigated in broiler chickens through six behavioural activities – locomotion, appetite, water drinking, pareses, paralyse, posture. As a result of the survey, the specific ethological pathognomonic complex for infectious encephalomyelitis in chickens was identified. These clinical manifestations of a pathoethological complex and specific behavioural activities could be used to support the diagnosis.

Keywords: diagnosis, infectious encephalomyelitis, pathoethology, poultry.

19. Georgiev R., **V. Dimova**, K. Uzunova, P. Atanasova, A. Kerkelova, M. Tosheska. 2017. Optimizing the thickness of the thermal insulation of buildings roofs in facility for gilts. Agricultural University of Tirana, *Albanian Journal of Agricultural Sciences*, (Special edition), Vol. 16: 199-205. ISSN 2218-2020. https://sites.google.com/a/ubt.edu.al/rssb/biotech_2

Abstract. The study aims to determine the optimum thickness of the roof construction of a facility for gilts when different fuel for heating are used and various kinds of insulation. The presented methodology helps to determine the annual energy losses through a 1 m² of roof construction. In analyses are taken into consideration various types of heat insulation as insulating sandwich - panels of plasticized LT-layered tin of thermal insulation with EPS, XPS and mineral wool. Annual cost for heat insulation is calculated as the sum of annual energy costs and depreciation for insulation. The obtained results show that the use of fuel - a dry

timber at - appropriate thickness of the thermal insulation are: for EPS and mineral wool - 100 mm; for XPS - 80 mm, and when Bobovdol coal is using appropriate thickness of the thermal insulation are: for EPS - 140 mm; for XPS and mineral wool - 100 mm respectively.

Keywords: facility's roofs, sows, energy losses, annual costs

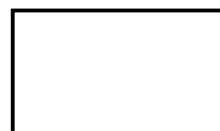
20. Dimova V., D. Georgiev, K. Uzunova, M. Tosheska. 2020. Determination of the Economically Expedient Thickness of a Reed Roof of Building for Laying Hens. Agricultural University of Tirana, *Albanian Journal of Agricultural Sciences (AJAS)*, 19 (2): 24-30. ISSN 2218-2020

Abstract. The purpose of the study is to determine the economically expedient roof thickness of a building for laying hens in use heat insulation from reeds and different fuel for heating (pellets and coal "Donbaski"). To achieve the purpose, 6 variants of a roof of 10, 15, 20, 25, 30 and 35 cm thick reeds plates are developed. The price of one reeds plate is calculated by including only the construction works for its preparation. The construction value of the ready roof (with VAT and transport) is obtained by adding to the value of the construction works for the preparation the value of the construction and assembly works of the site, the payment of the labor, the execution of the plank sheathing, the waterproofing and the laths. The annual energy losses through a 1 m² of the roof structure are determined through the submitted methodology. The annual heat insulation costs are calculated as a sum of annual energy cost and the depreciation allowances. Verification of condensation of water vapor on the inner surface of the reed roof was carried out. These results show that by using fuel pellets, most appropriate thickness of the thermal insulation is 25 cm, and by using Donbas coal - 30 cm. All investigated variants of the reed roof meet hygienic requirements to prevent condensation of water vapor on its inner surface.

Keywords: Reeds roofs of buildings, laying hens, pellets, coals, energy losses, annual costs

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Подпис:



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