Приложение 13

Резюмета

на публикациите на

доц. д-р Запрянка Николаева Шиндарска

представени за участие в конкурс за

заемане на академична длъжност „професор”,

които не са представени за присъждане на научно звание „доцент”

№ 1. **Zaprjanka Shindarska,** Tsonka Odjakova, Venelin Kafedjiev, Mariana Petkova & Christo Stanchev. Effect of probiotics Yea sacc1026 and Enterosan supplemented to rations for fattening lambs. Agricultural University-Plovdiv, Bulgaria, Scientific Works, vol. XLVI, book 5, 2001 349-354
A study on the effect of probiotics Yea sacc1026 and Enterosan supplemented to the basal diets of male lambs was carried out. Three groups of 8 lambs each from Karakachan breed took part in the experiment. The influence of probiotics on feed intake and consumption of nutrients, life weight changes, slaughtering indicators and chemical composition of meat was studied. No considerable differences were found out between the groups in respect of intake of feed and nutrients. A tendency was established towards higher final life weight (7 - 8%) and higher average daily gain (10 - 15%) in the two experimental groups. Better feed and nutrient conversion ratio and higher slaughtering indicators (13 - 17% for empty body weight and 17 - 20% for meat quantity) were established in the same groups. There were no differences in slaughtering indicators between the two experimental groups. Higher protein meat content (9% for the Yea sacc1026 group and 6% for the Enterosan group) was established.

№ 2. **Z. Shindarska**, M. Ignatova. Composition and nutritive value of some forages sources. Journal of animal science. 2001. 1: 141-144
Aiming to find new fodder resources for different animal species and categories and their profitable use, for twc successive years samples of waste products from the production of traditional cultures were collected and analyzec - peanut hay and pods gained from peanut production, anc bean and peas straw and pods gained from beans and pea production. The research included chemical, amino-acic and mineral analysis of these forages. Carrying out in vh and in sacco experiments on digestion and using empirics, equations was defined the fodder nutritive value, expressec in FU, FUG, FUM, PDI, BPR. Results of the analyses showed a comparatively high raw protein content, which is

higher for peas - crop pulf and pods, than for middle quality grass hay. With tb exception of peanut pods, raw fibers content in the studie. Forages were close to this in grass hay. Protein in these forages was comparatively rich in essential ammo acids excep for methionine. The studied forages were rich in calciun and phosphorus, and in between all microelements higher was the content of iron, except for beans pods. Pea pod were found to be with the highest energy nutritive value.

№ 3. F. Iliev, L. Kozelov, ***Z.* Shindarsk,** G. Uzunov. Determination of energy and protein value of silage and hay. Journal of animal science. 2002, 3, 33-36

In sacco protein degradability of alfalfa silage - „Full bloom“, corn silage - „Milk stage“, alfalfa hay „Early bloom“, meadows natural hay - „Full bloom“ and „Mature“ in wethers was: 0.86; 0.81; 0.82; 0.70 and 0.66.

One kg DM of the indicated forages contains: 0.81; 0.84; 0.67; 0.77 and 0.68 FUM: 0.75; 0.83; 0.63; 0.71 and 0.60 FUG: 173, 98,173,103 and 102g CP; 34, 42, 75, 75 and 75 g PDI and 83, 8, 52, -14 and - 11 g BPR.

№ 4. F. Iliev, L. Kozelov**, *Z.* Shindarska**, M. Ignatova. Determination of energy and protein value of pea hay and dehydrated alfalfa. Journal of animal science. 2002, 3, 37-39

In sacco protein degradability of Pea spring - „Full budding“, „Full bloom“ and „Pod formation“, Pea winter - „Full bloom“ and dehydrated alfalfa - „Full bloom“ in wethers was: 0.96; 0.94; 0.88; 0.93 and 0.44.

One kg DM of the indicated forages contains: 0.90; 0.81; 0.78; 0.81 and 0.67 FUM, 0.88; 0.77; 0.69; 0.77 and 0.60 FUG, 267, 228, 132, 205 and 168g CP, 18, 22, 58, 29 and 99g PDI and 150, 119, 27, 98 and 4g BPR.

№ 5. Todorova P., T. Odzhakova, **Z. Shindarska**, D. Genkovski, 2002, Effect of the grass forage conservation method on the productivity of lambs for fattening. Journal of mountain Agriculture on the Balkans, ISSN 1311-0489 vol.5, n.1, 18-30

A comparative study was conducted in order to evaluate the impact of grass forage conservation mode on the productivity parameters of lambs for fattening. Four treatments were tested such as meadow hay dried in the Field, untreated grass silage, meadow hay treated with anhydrous ammonia and grass wilted silage treated with carbamide solution. The parameters examined were the forages' chemical composition and their nutrient value.

The research and economic experiment included four male lambs of the Staroplaninski Tsigai breed that were fed *ad libidum* with the voluminous feeds tested and received equal

amounts of the concentrate mixture (0.600 kg). The lambs feed consumption and their weight gain progress were determined in the course of the trial period lasting 70 days. At the end of it a slaughter analysis followed determining the meat chemical composition and its physical and chemical properties.

The forage conservation method was found to affect the meat chemical composition and feeding value.

A trend of better performance in consumption, weight gain and forage utilization was found with the lamb group fed meadow hay treated with anhydrous ammonia.

The slaughter parameters, the meat chemical composition and physical and chemical properties were not considerably influenced by the different forage conservation methods.

№ 6. Ignatova, M., **Z. Shindarska**, Chr. Stanchev, Z. Denkova, 2002, A comparative study on the effect of " Enterosan" supplementation on productive performance of mono- and polygastric animals, Probiotics " Enterosan" technologies and health, 16-17, 05. Plovdiv, 62-67

A comparative study on the effect of the "Enterosan" probiotic supplemented to chicken broilers and fattening lamb's diets was carried out. A tendency by the "Enterosan" supplementation in animals' diets was established towards higher live weight of 42-days aged chickens (4.9%) and lower expense of forage by 1 kg gain (1.8%) in comparison with the not probiotic supplemented control group. By lambs the probiotic causes an increase of the final live weight with 8.0% and the better food efficiency of the forage with 13.0%. The slaughtering indicators by both kind animals are positive influenced by the ",Enterosan" supplement.

№ 7. M. Petkova, **Z. Shindarska,** Ts. Odjalcova. Comparative study of effects Of *yea sacc*^{1026} and of Enterosan on fermentation in rumen of lambs. Journal of animal science. 2002, 2, 50-54

Direct utilization of biological forage additives is one of the unique aspects in current feeding of ruminants. Additives are with microbial origin of different type - from yeast to bacteria (lactiferous, propionic, bifidobacteria etc.). A study was carried out on fermentation processes in lamb rumen with the aim to determine and compare the effect of Yea sacc1026 (Alltech Inc., USA - yeast preparation) and Enterosan (MSC „Interobmen", Bulgaria - bacterial preparation of lactoferous and bifidobacteria). The experiment was carried out for 45 days with 3 groups of eight male Karakachan lambs each with average initial live weight of about 19 kg. Animals were fed in groups at lib with equal in content base ration of 70:30% dry matter from concentrate mixture and grass hey. Differences between groups were in additives - of Yea sacc11126 and of Enterosan for the two experimental groups and the control one without additives. By the end of the experiment rumen liquid samples were taken post

mortem after 12 h hunger from three lambs per group. The concentration of ammonia nitrogen, production of total volatile fatty acids and their mollaric ratios were determined. Fermentation parameters - fermentative organic substance (FOS), non-glucogenic ratio (NGR) and yield of synthesized microbial protein were evaluated.

A significantly ($P < 0.05$) higher concentration of ammonia nitrogen was found at the experimental groups - 15.77 and 17.22 mg/100 ml for Yea sacc'"26 and for Enterosan respectively. Enterosan had more clear influence on production of total volatile fatty acids compared to Yea sacc1026 (152.9 vs. 109.0 mM/1). The comparison between experimental groups in fermentative parameters showed that Yea sacc11126 favoured more greatly the values of NGR (2.72 vs. 2.40), while Enterosan favoured higher quantities of FOS (2.51 vs. 1.73 kg/day) in the rumen.

A general conclusion was made that at conditions of highly concentrate lamb ration (average daily consumption of 10 MJ ME and 13 g CP) the utilization of Yea sacc'"26 and of Enterosan had clearly displayed a stimulating effect on fermentation in the rumen.

№ 8. E.Toncheva E., Z. Shindarska, T. Odjakova, V. Kafedjiev. The effect of probiotics ***yea-sacc*** 1026 and enterosan on certain tissue characteristics of fattened lambs. Carbohydrase activities. 2002. Journal of animal science. 3: 53-60

The probiotics are natural food additives with a microbiological spectrum of action in the digestive tracts of animals, in which microbiological flora participates to a significant degree in the digestive process. The effects of the viable yeast cultures (YC) of the *Saccliaromyces cerevisiae* type on rumen metabolism include the rate of the microbiological fermentation, the protein turnover of the microorganisms, pH, and the metabolism of structural and nonstructural carbohydrates (Lyons, 1992).

The stimulation of the cellulolysis in the rumen by YC is partially connected with their effect upon the fermentation of the starch and oligosaccharidas- es of the ration of the rumen. In highly concentrated feeding, considerable amounts of starch avoid the rumen fermentation and reach the duodenum. Post-ruminal digestion of the carbohydrates of the ration, it may be estimated by defining of the intestinal carbohydrase activities. The increased intestinal maltase activity (30-35%) in the animals being fed with highly concentrated rations is reported by Khatim and Osman in 1983. In the previous investigation (Toncheva and Shindarska 1998), a significant effect of the level of feeding (protein energy) upon the mucose activity of fed Karakachan lambs was specified.

The effectiveness of adding live *YC* upon the carbohydrates (structural and nonstructural) of the ration is estimated primarily by the amount of VFA in the rumen juice.

The aim of the present comparative investigation is to determine the effect of adding

Yea Sacc

№ 9. E. Toncheva**, Z. Shindarska**, Y. Profirov. Effect of probiotics *Yea-Sacc* ^{1026} and Enterosan on some tissue enzymes of fattening lambs. Journal of animal science. 2002. 6: 42-45

Nine male lambs with 18 kg mean BW were used in an experiment to examine the effects of Yea-Sacc 1026 - 2g/kg feed (Alltech Inc.) and capsules Enterosan (lactobacilli and bifidobacteria) given four times (at the beginning of the trial, at 10"', 20'" and 30'" day) to basal diet (concentrate to meadow hay 70:30) on the activities of Zn-containing enzymes - leucine aminopeptidase and alkaline phosphatase and the activities of AST and ALT in the jejunal mucosa, renal cortex, liver and blood serum.

Yea-Sacc 1026 decreased mucosal leucine aminopeptidase activity-significantly and mucosal alkaline phosphatase activity tended to decrease. Enterosan had no effect on leucine aminopeptidase and alkaline phosphatase activities. Mucosal and serum AST and mucosal ALT activities were reduced with Yea-Sacc 1026 and Enterosan supplementation.

The probiotics investigated had no effect on liver enzyme activities.

The most expresive effect of both probiotics was the significante reduction of renal cortex alkaline phosphatase activity. The results obtained in this experiment and in a previous work (Toncheva et al., 2002) suggested adaptive alterations of renal metabolic activity of lambs with Yea-Sacc 1026 and Enterosan supplementation of feed.

№ 10. **Z. Shindarska**, G. Ganev, M. Krasteva. Effect of feeding lambs for fattening with whole ration mixtures with different levels and sources of protein. Journal of animal science. 2002. 4-5 : 37-42

The experiment was carried out with 60 male lambs (Semifine-wool crosses of South-West Bulgaria) split in five groups with initial live weight of 15 kg and final weight of 30-35 kg. The aim was to determine the biological effect of feeding on whole ration mixture including combined forages with different levels and sources of protein, which was based on contemporary methods for assessment as the French PDI system of INRA was used. Such rations were considered (ratio of combined forage to hey 85:15) in which digested protein in the intestine (DPI) was expressed through PDIN and PDIE values in five different ratios and two levels of crude protein. Depending on the weight, the experiment was separated in three sub-periods: 15-20 kg, 20-25 kg and 25-30 kg, for detecting the lambs nutrient needs. Weight development, consumed nutrients and their amount per 1 kg gain were traced depending on the level and the source of protein and fattening period.

The highest gain during the experimental period (15-35 kg) - 284 g/day, was obtained for consumed protein expressed as PDIN/PDIE - 96/95 g/day and the lowest gain of 211

g/day, at consumption of respectively 72/82 g/day. The ensured higher values of PDIN compared to those of PDIE did not lead to higher gain.

№ 11. Колев,А., Ф.Илиев, **З.Шиндарска**, В. Карчева, Е. Кистанова, 2003, Влияние добавки пробиотика Биопро-I к основному рациону на качество спермы баранов в сезон размножения, Сборник материалов научно-практической конференции, 25-27 май, Пенза, ISBN 06-338-436-33,15-148, 145-147

Использование антибиотиков в качестве пищевых добавок при кормлении сельскохозяйственых животных в странах европейского сообщества постепенно ограничивается за счет введения новых - пробиотических продуктов.

Современные пробиотики в основном содержат молочно-кислые, пропионовые и бифидобактерии. Они имеют иммуностимулирующее, холестеринолитичное, антиканцерогенное действие и подавляют развитие патогенной микрофлоры. Суммированны ефект их действия выражается в положительном влиянии на здоровье и продуктивность животных.

Цель нашето зксперимента была изучение количественных и качественных показателей спермы баранов, получавших в качестве добавки к основному рациону пробиотик Биопро-1 в сезон размножения.

№ 12. **Z. Shindarska**, I. Alexiev, M. Ignatova, F. Iliev. Effect of suplement of feed additive bio-pro on female lambs performance. Journal of animal science. 2003. 1-3, 29-31

The experiment was carried out with two groups lambs. The experimental group was given diet with supplement of lg/day/animal BioPro-I. It was examined the influence of the addition on lambs live weight, average daily gain, nutrient intake and food utilization.

There were not any differences between groups in food and nutrient intakes.

It was found that the addition of probiotic had a positive effect on live weight; in experimental group the average daily gain was increased by 5.2% (192 and 202 g/day, respectively for control and experimental groups)., and food utilization was lower by 8.5% in experimental in comparison with control group.

№ 13. Кръстева, М., **З.Шиндарска**, Г.Ганев, 2003, Влияние на дажбата и нейният икономически ефект върху растежа на агнетата за разплод, сп. Алтернатива, Изд. УНСС кн.6, 30-31

Технологията на отглеждане и особено нивото на хранене влияе върху растежа и развитието на агнетата за разплод. Оптималният среден дневен прираст определя не само времето на запложданe, но и плодовитостта на дзвиската и жизнеспособността на

новородените.Той зависи не само от нивото на протеина в дажбата, но и от неговата степен на разградимост в тънките черва. Не е без значение и стойността на биологически пълноценната дажба, тъй като тя рефлектира и върху разходите до достигането на оптималната жива маса за запложданe.

Целта на нашия експеримент беше да се установи както влиянието на нивото на смилаемия в тънките черва протеин в дажбата на женски агнета за разплод върху техния растеж и развитие, така и върху икономическия ефект от отглеждането им.

№ 14. G. Ganev**, *Z.* Shindarska**, M. Krasteva. A comparative test of combined forages with different levels and sources of protein with utilization of the new systems and norms for feeding. Journal of animal science. 2003. vol.XL, ISSN 0514-7441, 3-4, 26-29

The study was carried out with 60 male lambs (semi fine wool crosses for South-West Bulgaria) with the aim to determine the biological effect from feeding with combined forages comprising different levels and sources of protein with utilization of the protein system for forage INRA - France. Lambs were divided into five groups (with 12 lambs per group) with an initial live weight of 15 kg and reared for 70 days for reaching a final live weight of 30-35 kg.

The tested rations were combined forage/grass hey in 70 : 30 ratio in which the digested protein in the intestine (PDI) expressed as PDIN/PDIE was of five different dependencies at different levels and sources of crude protein.

The experimental period was divided in three sub-periods: Is' - 15-20 kg, 2nd - 20-25 kg, and 3rd - 25-35 kg depending on the weight. The consumption of forage and nutrients, the weights and utilization of forage and nutrients were traced.

It was found that the examined levels and the source of crude protein in the conditions of the experiment have not influenced the consumption, weight and digested protein. PDI expressed by PDIN/PDIE values in different values did not change the gain.

№ 15. F. Iliev, **Z. Shindarska**, L. Kozelov, M. Ignatova. Determination of energy and protein value of wheat bran, sunflower meal, soybean meal and fish meal. Scientific conference with international participation. St. Zagora. 2004. Vol. 3, Livestock and Veterinary Medicine, 108-112

In sacco protein degradability of wheat bran, sunflower meal, soybean meal and fish meal in wethers was: 0.87; 0.57; 0.58 and 0.36.

One kg DM of the indicated forages contains: 0.96; 1.11; 1.23 and 1.21 FUM; 0.96; 1.10; 1.29 and 1.24 FUG; 191,572,484 and 667 g CP; 89, 268, 264 and 418 g PDI and 67, 209, 149 and 142 g BPR.

№ 16. F. Iliev, L. Kozelov, **Z. Shindarska**, M. Ignatova. Determination of energy and protein value of grain feeds**.** Scientific conference with international participation. St. Zagora. 2004. Vol. 3, Livestock and Veterinary Medicine, 113-117

In sacco protein degradability of grain feeds (barley, oats, triticale, broa beans and peas) in wethers was: 0.88; 0.84; 0.69; 0.77 and 0.95.

One kg DM ofthe indicated forages contains: 1.31; 1.15; 1.42; 1.31 and 1.1 FUM; 1.45; 1.19; 1.57; 1.45 and 1.25 FUG; 131, 138, 151,284 and 270 g CP; 9' 66, 102, 128 and 71 g PDI and -20, 13, -25, 72 and 113 g BPR.

№ 17. Yanchev, I., D.Gudev,D., Popova-Ralcheva,S., **Z. Shindarska**, Z., Ignatova,M., 2007, Effect of supplemental chromium on some blood constituents in calves, Russian Agricultural Academy, Problems of productive Animals biology,ISSN 1995-7262, n1,47-51

The study was designed to investigate the effect of chromium picolinate given during the milk period on blood metabolites in calves, measured immediately after weaning. Experimental calves (3 males + 2 females) were fed the control diet supplemented with chromium as Cr-picolinate (Hankintatukku Oy Finland) on d 10 (150 pg), d 30 (250 pg) and d 60 (350 pg). Chromium was dissolved in the milk just prior to feeding. Blood was collected via jugular venipuncture at the age of 3 days and after weaning (d 60). Plasma glucose levels in experimental calves tended to be higher than those in the control animals, both before the onset of Cr treatment and at the end of the experimental period. Supplemental chromium-picolinate decreased plasma cholesterol ($P<0.05$) and cortisol ($P>0.05$) levels, but had no effect on plasma indol, glucose and urea levels, after weaning of the calves. The data obtained suggest that supplemental chromium does not have any effect on the equilibrium between the microorganisms that normally reside in the gastrointestinal tract.

№ 18. Marasheva V., G. Angelov**, Z. Shindarska**. 2007, Analyzing the effect of probiotic lactiferm l 200 on productive and qualitative indexes and some haematologic and biochemical indexes of blood with chicken-broilers. Proceedings of the conference "Traditions and Modernity in veterinary medicine" ISSN 1313-4337, FVM, 302-310

Investigation in farm conditions with broilers from the hybrid- Hubbard Classic in poultry farm at „Snejana Vasileva - Phoenix" in Mramoren village, Vratsa region was held. The BIRDS were fed standartly with combined feeds (threestaget), and the aim was to test the effect of including Lactiferm L 200 in the water for drinking. The probiotic is intended to be used with thewater in appropriate doses: 1 g/1000 - 0.5 g/1000 - 0.25 g/1000

Results received from haematological and biochemical profile shows that glucose, the

overall number at the leukocytes (WBC) and the degrees of average corposkolary mtrocytes volume (MCV) are higher. The results are as well analogous for the weight development, the consumation and the use of the commissariat.

Probiotic has a positive effect on the weight and the usage of the forage. The results from the HpMtnlqttic test do not show differences between the control and the test groups.

№ 19. M. Ignatova, **Z. Shindarska**, M. Krasteva, J. Naydenova, A. Kirilov. Chemical composition and nutritive value of jerusalem artishoke. Plant science. 2007. , ISSN 0568-465X, 44, 5,461-464

The chemical composition and nutritive value of different parts of the jerusalem artishoke (Heliantus tuberosus) during its vegetation phases is determined. It was established a high content of dry matter in the whole plant in the mounts of September and October, low content of cmde fibers in the tubers and high in vitro digestibility of their dry matter. The content of crude protein in the different parts of plant changes from 8.0% by 19.04% and is biggest in the leaf mass. The chemical composition and the nutritive value of Jerusalem artishoke make it suitable forage both in fresh and conservative condition for livestock and poultry.

№ 20. K.Boychev, **Z.Shindarska**, N. Kolushev, 2008. Variability of the number of erytrocytes in sheep blood.I. Trend in breed and seasonal changeability, J. Anim. Sci., b.1, 57-62

The aim of this study was to determine the trends in the variability of the number of erythrocytes in sheep blood and to evaluate the role of the factors breed appurtenance and annual season in the structure of the total variability of this hematological parameter.

The experiment was carried out with 394 sheep from four breeds (Awassi, East Friesian, Pleven blackheaded, Romanov) and crossbreedings of the Synthetic Population Bulgarian Dairy sheep. The blood samples were taken in April, July, November and February from v. jugularis. The effects of the factors discussed were evaluated by the coefficient of interclass correlation.

The number of erythrocytes in the blood of the investigated populations varied from 6.80x 1012/1 (for Awassi breed in the summer) to 9.67xl012/l (for East Friesian sheep in the autumn).

A significant effect of the two evaluated factors on the dynamics of the index discussed was observed, but the share of seasonal variability (20.57%) was considerably higher.

№ 21. Boychev K., K. Tsenova**, Z. Shindarska**, 2011, Variability of the nombur of erythrocytes in sheep blood. II. General evaluation of the interaction of breed and seasonal differantiootion, J. anim. Sci. 5:47-52

The effect of breed and seasonal differentiation of the number of erythrocytes in sheep blood within the range of the alternative source of variation was analyzed. The role of the interaction of both factors in the structure of total variability of the hematological parameter discussed was evaluated.

Three hundred and ninety four animals of four breeds (Avassi, East Friesian, Pleven black-headed, Romanov) and Synthetic Population Bulgarian Dairy sheep were included in the experiment. The blood samples were taken in April, July, November and February. The number of erythrocytes was determined by optical camera method.

A very important effect of the breed appurtenance (50.10%) was registered in autumn. Greatest seasonal variability of the number of erythrocytes was found for East Friesian breed.

The basic part of the total factor's effect for the two evaluated sources of variation of the hematological parameter discussed was associated with seasonal changeability, while the effect of interaction of both factors was significant, but considerably less important.

№ 22. **Z. Shindarska**, K.Tsocheva, M.Ignatova, P.Stoykov, I.Yanchev, D.Girginov. 2008. Effect of the probiotic enterosan and the organomineral cromisan on simmental calves' productivity during the suckling period. J. anim. Sci. ISSN 0514-7441. vol.XLV,2,11-18

An experiment was carried out for determination of the effect of the probiotic Enterosan and the organic chrome-containing preparation Cromisan on the live weight, forage utilization and forage consumption of male calves of the Bulgarian Simmental breed during the suckling period.

The calves were distributed in three groups (6 calves per group) - control one, 1 st experimental one which received the probiotic Enterosan and 2nd experimental one which received the organomineral preparation Cromisan.

The significant differences between the groups for the studied traits were determined by the method of analysis of variance. Predlagam tova izrechenie da otpadne GD.

It was found that the adding of the probiotic Enterosan and the organomineral preparation Cromisan did not affect significantly the live weight of the calves during the suckling period.

The addition of the probiotic Enterosan during the suckling period of the studied calves affected significantly the utilization of the forage and the consumed nutrients and energy.

Significant differences exist for the consumption and forage utilization between the experimental groups.

№ 23. P. Stoykov, **Z. Shindarska**, M. Ignatova, K. Boychev, I. Yanchev, D. Girginov. The Effect of Enterosan Probiotic on the Productive Indexes by Calves of the Simental Breed**.** Agricultural Science. ISSN 1313-3534, 2008. vol. XLI, 2, 36-41

A research on establishing the effect of the supplement of the "Enterosan" probotic on calves from the "Simental" breed has been done. The doses and the scheme of applying are a recommendation of the producer (Higher institute of food and flavour Industries - Plovdiv).

It has been established that the supplement of Enterosan after wean does not affect the investigated parameters (weight growth, consumption and utilization of the fodder). A reliable influence by the probiotic applying before and after wean has not been registered in comparison to the control group concerning the middle daily growth, animal weight and the affiliated nutrients but a proved ($p< 0.01$) better utilization of the affiliated fodder, energy and raw protein (RP) by $p< 0.01$ by the test group has been observed.

The analysis of the intermediate in the organized dispersion complex indicates a reliable effect from the supplement of Enterosan from the birth concerning the utilization of energy ($p< 0.01$), fodder ($p< 0.05$) and RP ($p< 0.05$).

№ 24. Krasteva, M., **Z.Shindarska**, 2008. Influence of protein level in hole ration mixture of male and female lambs on some productive indexec, Oktober, Budapesht, Hungary P. Veterinery faculty, Vol. XXXII

A comparative analysis has been conducted with male and female lambs feeding on whole ration mixtures with different level and sources of protein. The lambs were divided in two groups with 12 lambs per group.

The purpose of this study is to determine how the level and sources of protein in the combined forage influence on the production indicators.

The major findings are:

The protein level in the whole ration mixtures has unproved impact on the weight development of male and female lambs during the experimental period;

The protein level in the whole ration mixtures influences the dry matter consumption (which is higher in female lambs;

The male lambs utilize better foodstuffs and energy than the female lambs by equal protein level in the whole ration mixtures.

№ 25. Marasheva, V., **Z.Shindarska**, G.Angelov, Krasteva,M., (2008). Influence of probiotic Lactoferm over the chemotological and the biochemical profile of the blood and the quality of

the liver at duckling mulalard. 7-th International Scientific Conference : Ecology and veterinary medicine, University of Veterinary Medicine, Kosice, ISBN 978-80-8077-084-6,p.133-138

The experiment with the ducklings mullard has been held with the goal to determine the consequence of probiotic Lactiferm on some haematological and biochemical indicators of the blood and the quality of the liver.

The animals have been separated in two groups – a control one and a test one / which was given from the first to the fifth day probiotic Lactiferm L 200 with drinking water in doses 1 gr. /1000 ducks and from the 6-th day to the end of the experiment they received probiotic Lactiferm L 5 with the forage as follows: from the 6-th day to the 6-th week: 500 gr. / tone of the forage and after the 6-8-th week of the period till the cuddling and during this period - 200 gr. / tone of forage. The ducklings were kept in the same conditions without additional influence on the microclimate, with the same scheme of nutrition and prophylactic against diseases in both groups.

During these periods were controlled the consummation of forage, the weight development, some hematological /WBC,LYM#,MID#,GRA#,LYM%,MID%,GRA%,RBC, HCT,MCV,RDW,MCH,MCHC,HGB,RDW-SD,PLT,MPV,PCT,PDW/and biochemical/ Total protein, Glucose, Urea and Cholesterol/ indicators of blood as well as histological tests of the liver before the cuddling and after that.

The obtained results show inessential differences between the control and the test groups concerning the consumption, the weight development and the quality of the liver. Probiotic Lactiferm has proved reliable influence on the hematological profile of the levels of red blood cells, hemoglobin and hematocrit during the starter-period. A rise in the glucose and the cholesterol to the tested group with the help of probiotic is also proved.

There are no proved distinctions in the weight of the liver and its histological tests between the two groups at the end of the cuddling.

№ 26. **Z. Schindarska,** M. Krasteva. Establishing of digestibility coefficients of foodstuffs and nitrogen balance of mixtures with different levels and sources of protein. Journal of animal science. , ISSN 0514-7441. 2008. vol. XLV, 1, 9-13

Balance experiments were carried out with 9 lambs (semifine-wool crosses for South-West Bulgaria) for determination of the digestibility coefficients of foodstuffs of whole ration mixtures containing 146 g, 171 g and 190 g crude protein per kg dry matter.

It was obtained that the protein levels of the ration did not affect the dry and organic matter, the crude fibers, but affected the crude protein and crude fat digestibility. The different protein levels of the whole ration mixtures did not affect the nitrogen excreted by the faeces, but affected the nitrogen excreted by urine.

The best retention of protein was by lambs fed with ration containing 171 g/dry matter

crude protein, and the worst one at the highest quantity of crude protein.

№ 27. Тодоров,Т., **З. Шиндарска**, 2009, Corsuma Longa – биологична активност и приложение в клиничното хранене при животните, Животновъдни науки, vol.XLVI, 3, 47-50

Проучена е биологичната активност и приложимостта в клиничното хранене на Curcuma Longa (индийски шафран). Растението е многогодишно тревисто и принадлежи към сем.Джинджифилови (Zingiberaceaea). Растението се използва в традиционната медицина при наранявания, възпалителни процеси, заболявания на храносмилателната система, черен дроб и ракови заболявания. Разгледани са антиоксидантните свойства на куркума, дължащи се на ортотоксифенолната група, както и изразеното противовъзпалително действие свързано с подтискане на активността на фосфолипазата, липооксигеназата, простагландинколагеназата, еластаза и др. Посочени са убедителни доказателства за общотоксичните и имуностимулиращи ефекти на екстракт от куркума използван като фуражна добавка при пилета бройлери и растящи прасета, както и положителното влияние върху растежа и качеството на месото.

№ 28. **Шиндарска, З.,** П.Първанов, 2009, Приемането на повече фуражи при високопродуктивни крави предпазва от кетоза, сп. Ветеринарна сбирка, ISSN 0205-3829, брой 9-10 с.15-17

Разгледани са въпросите свързани с профилактиката на заболяването „ кетоза", което се среща най-често при високопродуктивните крави. Правилното хранене на високопродуктивните крави е водещ фактор за предпазване от заболяването.

В настоящата работа се разглеждат въпросите свързани с нарушената обмяна на веществата, изтъкната е и ролята на ЛМК и тяхната резорбция в кръвта под формата ацетат (65%) и в по-малка степен като пропионат (20%) и бутират (10%). Посочена е и първопричината на заболяването - недохранването в резултат на ниския прием на енергия отколкото е необходимо, в резултат на което се черпят телесни резерви, което води до получаване на свободни мастни киселини СМК т.н. НЕМК (неестерифицирани мастни киселини) и механизма на действието им при висока концентрация в кръвта. Направени са и препоръки за необходимите мерки и дажби при възникване или симптоми на заболяването.

№ 29. Mehmedov T., S. Radanski**, Z. Shindarska**, I. Dimitrova, V. Georgiev, R. Saimin. 2009. Probjot1k clostat effect in same economical parameters in pheasants with resettlement purpose. Proceedings "Tradition and Modernity in veterinary medicine," Jubilee session 15

years Faculty of Veterinary Medicine at the University of Forestry in Sofia 20.11.2009, 157-166

In order to test the effect of probiotic CloSTAT an experiment was conducted with one day to 90 days old pheasants. Wc tested two groups - control and experimental. Nutrition was conducted freely and in group. Feed consumption and weight development were controlled during the experiment for the two periods (starter / grouer). We calculated the forage assimilation, feed energy, protein and growth based on the controlled parameters of the conversion of forage, feed energy and protein for both groups is different, which is due to differences in weight development and growth at equal consumption of forage. There are no differences between the both groups regarding mortality index during the experimental period.

№ 30. Кръстева М., **З. Шиндарска**, Д. Чотински, 2009, Сравнително проучване на ефекта от биологично активни добавки в дажбите на пилета бройлери и агнета за угояване върху някои продуктивни показатели, Сборник публикации "Приятели на науката", ИК" Знак" 94, ISBN 978-954-8305-02-0, 225 – 230

Производството на биологични продукти от животновъдството изисква добавките и стимулантите в дажбите на селскостопанските животни и птици да имат органичен произход. Съществена роля имат пробиотиците и растителните екстракти (т.н. ботанически растения). Използването им се увеличава особено след забраната на нутритивните антибиотици в комбинираните фуражи на различните видове и категории животни и птици. У нас наредбата влезе в сила от 1.1. 2006 г.

Целта на настоящото проучване е да се сравни ефектът от добавянето на пробиотиците Ентеросан, Lacto Sacc и Yea Sacc, както и на препарата XTRACT, който е на растителна основа, включени в дажбите на пилета бройлери и агнета за угояване върху продуктивността.

№ 31. K. Tzocheva, R. Petrova, P. Stoikov, **Z. Shindarska**. Estimation of the Season and Rearing System Effects on Variation of Some Characters of Fattening Calves from Bulgarian Simental Breed. Agricultural science. 2009. XLII, 1, 46-57

Influence of the season and rearing systems on the variation of final live weight and average daily gain of fattening calves from Bulgarian simental breed was estimated through monofactorial and two factors nested analysis of variance.

It was found that season in which fattening of calves started had no significant influence on variation of the studied characters.

Variance estimates associated to rearing systems were significant ($p<0.01$, $p<0.001$) for

both characters. Therefore we can considerthat rearing systems could influence the variation of final live weight from 12% to 25%, and the variation of average daily gain from 20% to 40%.

The rank correlations (rs) between initial and final live weight of the calves were significant ($p<0.05$, $p<0.01$) for all three rearing systems in both experiments. The rank correlations were estimated by the coefficients of determination, which were between 31% and 85%.

№ 32. Genova K., **Z. Shindarska**, M. Ignatova, P. Stoykov. 2010, Effect of probiotic enterosan on some biochemical parameters and factors of immune resistance in calves of bulgarian simmental breed. Proceedings of the conference "Tradition and Modernity in veterinary medicine, ISSN 1313-4337: 139-145

Application of probiotic Enterosan on calves-sucklings contributes to improving physiological state, biochemicall profile of blood serum and non-specific resistance.

Statistical values of serum globulins, urea and creatinine levels were recorded in probiotic- treated calves. Supplementation with probiotic caused not significant reduction of total cholesterol and alkaline phosphatase. The results suggest that there is beneficial effect of probiotic on serum concentration of IgG and on lisosyme activity of blood serum in treated calves.

№ 33. N. Metodiev, E. Raicheva, **Z. Shindarska**. Effect of feeding by norms at female breeding lambs from synthetic population bulgarian milk. J. anim. Sci. 2010. vol. XLVI, Application 1: 246-251

The aim of this study was to establish the effect of feeding by norms (FN) at female breeding lambs from breed Synthetic Population Bulgarian Milk (SPBM). The experiment was carried out in Institute of Animal Science - Kostinbrod with 18 female breeding lambs, in 2 groups according their type of birth - single (7 lambs) and twin (11 lambs). The lambs were equal at age (89 for twins and 87 for singles). The experiment continued 90 days. The composition of ratio and the amount of forages were accordingly the requirements of the norms by Todorov and Dardjonov, 1995. The live weight of the lambs was measured individually at the beginning of the experiment and after that monthly. Food intake was controlled daily. It was calculated the average daily intake of forage, energy (FUG) and protein (PDI) per lamb and their gain efficiency per 1 kg. The obtained information was analyzed by variation-statistical methods.

The obtained result showed, the applied norm feeding ensured similar daily gain for the whole experimental period - 0.139 kg for singles and 0.144 kg for twins. The live weight of singles (41.16 kg) at the end of the period was significantly (PO.01) higher compared to twins (35.21 kg).

The average daily intake of forage, energy and protein was 1.416 kg, 1.11 FUG, 98.7 g for the singles, and 1 .2— kg, 0.84 FUG, 78.3 g for the twins. The gain efficiency per 1 kg for forage, energy and protein was 10.19 kg 7.98 FI G 686.45 g for the singlea- 8.64 kg, 5.83 FUG and 522.7 g for the twins.

№ 34. Първанов,П., **З.Шиндарска**, Д. Яновски,Св.Тренева,2010,Млечна треска при крави-клинични признаци, лекуване и профилактика, Животновъдни науки, ISSN 0514-7441, XLVII,6,73-80

Настоящата разработка е с приложен характер и в помощ на практиката. Разгледани са въпросите свързани с основните клинични признаци характерни за млечната треска, заболяване засягащо основно високоппродуктивните крави. Посочени са предразполагащите фактори за възникване на заболяването, като възраст, порода, разлика катион-анион в дажбите на сухостойни крави силно изразена през втората половина на сухостойния период.

Направени са препоръки за практиката с оглед лечение на заболяването при използване на калциеви препарати. Посочени са резултати от собствени изследвания при лечение на крави при различна лактация, степен на заболяване и кратност на третиране.

Посочени са и средствата за профилактика – чрез регулиране на разликата катион-анион в дажбите, намаляване съдържанието на натрий и калий в дажбите, създаване на лека физиологична киселинност, намаляване на калция в дажбите през втората половина на сухостойния период, както и провеждане на медикаментозна профилактика чрез използване на препарати съдържащи Са-хлорид и Са-сулфат.

№ 35. **Shindarska Z.**, N. Metodiev, E. Raicheva, 2011, Effect of application of feeding by norms of lambs from Ile De France, Arhiva Zootechnica, vol. 14, 1; 35-40

The aim of this study was to establish the effect of feeding by norms of female breeding lambs from Ile de France breed. The experiment was carried out in the Institute of Animal Science - Kostinbrod. The experimental animals were divided in 2 groups according to their type of birth - single (11 lambs) and twin (10 lambs). The lambs were equal in age (118±0.91). The experiment continued 90 days. Food intake was controlled daily. The composition of ratio and the amount of forages were according to the requirements of the norms by Todorov and Dardjonov, 1995. The chemical analysis of the forage, which was used, was done by adopted methods (Sandev, 1979). The live weight of the lambs was measured individually at the beginning of the experiment and after that monthly. It was calculated the average daily intake of forage, energy (FUG, Food Unit for Growth = 6 MJ NE (net energy) at q = 0. 5 (q - coefficient for food quality) and protein (PDI) per lamb and their gain efficiency per 1 kg. The obtained information was analyzed by variation-statistical

methods.

The obtained results showed, the applied norm feeding ensured reaching of live weight, which respond to the age and type of birth (singles - 50.27 kg, twins - 44.7 kg) of the breeding female lambs from Ile de France breed. The average daily intake of forage, energy and protein was 1.626 kg, 1.625, 123.17 g for the singles, and 1.526 kg, 1.5, 116.9 g for the twins. The gain efficiency per 1 kg for forage, energy and protein was 11.70 kg, 11.69 FUG, 886.14 g for the singles and 10.82 kg, 10.64 FUG and 829.08 g for the twins.

№ 36. ***Z.* Shindarska**, M. Petkova, P. Parvanov. Sweet corn silage and possibilities to use as component of ration of different ruminants. 2011. Journal of animal science. 2, 10-13

A study was carried out to evaluate the waste of sweet com as feed raw material for ruminants using non-nutritional parameters. The chemical composition of the both green mass and produced silage was established by Weende analyses. On this basis the energy value of the silage was calculated. The obtained experimental data and calculated values are used to development of options for practical use and application of sweet com silage.

№ 37. **Шиндарска З.,** В. Киров, Я. Калайкова, Б. Байков, Цвеклото – алтернативна енергийна култура за производство на биогаз, Осми международен симпозиум „Екология – Устойчиво Развитие" гр. Враца, 2012; стр. 220-225

Проведено е проучване на цвеклото като алтернативна енергийна култура. Проучването включва: подходящи сортове цвекло за производство на биогаз, технология на производство и сравнителен анализ на добиви от единица площ и произведено гориво. Установено е: бърза ферментация протичаща във ферменторите при използване на цвекло като субстрат, което дава възможност за бързо производство на биогаз; максимална ефективност при производството на биогаз; високи добиви от свежа биомаса на единица площ, което гарантира ритмичност и сигурност при производството на биогориво; за постигане на гаранция за сигурност и качество при производството на биогаз от цвекло е необходимо почистване и правилно съхранение на цвеклото.

№ 38. **Shindarska, Z.,** O. Lutskanova, B. Baikov, Evaluation of New Raw Materials for Production on biogas, 2012, Journal of Balkan Ecology, vol.15, №2, 197-201

Raw materials for biogas production were compared. Now, we have examined cattle manure with substrates that are new for the country, such as com silage and raw material that is new for Europe, such as silage from the biomass of deciduous forest ecosystem's Bora. Forest silage is a summarized conception that is specific for each forest ecosystem with

biocoenosis, which is typical for Bulgaria. Eight (8) toxic elements are objects of estimation. We proved that the carbon-hydrogen ratio for the examined cattle manure is in the optimal interval recommended for biogas production. The same ratio for the examined biomass of vegetable origin (com and forest silages) is higher than the optimal one for biogas production. Optimization of the ratio can be achieved through combining the substrates in organic manures.

№ 39. **Shindarska Z**., V. Kirov, G. Kostadinova, B. Baykov, 2013. Comparative assessment of plant resources as substrates for bioshlam production. Agricultural Science and Technology, vol. 5, No 4, pp 438 – 442

It was made a comparative assessment of the main technological parameters of the silages of different types as a source for the production of biogas as well as it was given an assessment to the bioshlam derived from them. For this purpose the following silages were studied: corn silage, sweet corn silage, forest silage and silages of straw and three types of beet (sugar beet, red beet and fodder) in a ratio of 10 : 90%. It was found that the investigated energy resources in terms of the technologically permissible parameters (dry matter, organic matter, macro and micro-elements) can be used as raw materials in the mix for biogas production. The forest silage as a general term which is specific for each forest ecosystem, due to substantial differences in the structure of the biocoenoses as well as in the soil composition, can be an alternative raw material to the energy crops for the production of biogas with dry matter content of 26.68%, organic carbon content – 39.50% and nitrogen content – 1.30%, as the ratio between them is 30,38:1 (C:N). After methane fermentation, a high rate of mineralization of organic matter is observed in all tested materials, expressed by high values in the bioshlam of the main macro-elements (N, K, P, Ca and Mg). Established concentrations of the 8 toxic elements (Cu, Zn, As, Cd, Cr, Hg, Ni and Pb) in the bioshlam, derived from the studied plant materials, are below the critical limit for the soil and plants.

№ 40. **Shindarska Z**., Zaharinov B., Petrova V, Ivanov P., Kostadinova G., Kirov V, Baykov B., Ecological assessment of differrent raw materials for biogas, International Symposium ISB-INMA TEH. Agricultural and Mechanical Engineerin, Bucharest 2013, page 215-222

A comparative ecologic valuation of different raw materials for biogas production has been made. The valuation is based on the qualities of the different substrates: from energy cultures (sugar, fodder and red beet, leaves mass from the Paulovnia spring and autumn leaves). Three type of fertilizer (cattle from non-litter breeding, swine and non-removable bird fertilizer litter) as well as substrates from waste water of the WTP- Waster water treatment plan (mixed sediment, primary and secondary sediment). The examined raw material has been analyzed according to the following parameters: Dry matter (DM) ,Organic matter (OM), Organic Carbon (OC), Nitrogen Kjeldahl (N), Nitrogen Ammonium (N -ammonium),

Nitrogen nitrate (N- nitrate), Patassium (K), P (Phosphorus), pH (H2O) and heavy metals – arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Mercury (Hg), Nickel (Ni), Lead (Pd), Zinc (Zn). The results of the examined substrates received from different raw materials (vegetal, organic fertilizers and waste water) give us ground to make the following conclusions: the examined substrates respond in the physical-chemical parameters to all technological requirements of raw material for biogas production (DM,C and proportion C:N).

The established differences in the content of nitrogen / within the borders of 1,8% (substrate-leaves mass Paulovnia- spring) to 7,75% of substrate 7 (organic fertilizer)/ allow the combination of the substrates in order to adhere the Nitrate directive of the EU.

The established differences in the active forms of nitrogen allow exploitation of programs for fertilizers with the participation of raw materials for biogas production.

Our examination of substrates and show a content of heavy elements under the critical admissible limits.

№ 41. B. Zaharinov, **Z. Shindarska**, S. Garvanska, V. Kirov, B. Baykov, Agroecologic valuation of organic waste in different technolgies of storage, 10th International Symposium "Modern Trends in Livestock Production, 2013, page 580-589

A study has been conducted, based on three types of fertilizers / cow, pig and bird manure/ and bioshlam /received from clearing station/ that have been storage in different technologies in order to make an agroecologic valuation. The different types of fertilizers and wastewater in different technologies of storage have been analyzed according to the following parameters: Dry matter (DM),Organic matter (OM), Organic Carbon (OC), Nitrogen Kjeldahl (N), Nitrogen Ammonium (N -ammonium), Nitrogen nitrate (N- nitrate), Sulfates (SO4) , Calcium Oxide (CaO), Magnesium Oxide (MgO), Patassium (K), P (Phosphorus), pH (H2O) and heavy metals – arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Mercury (Hg), Nickel (Ni), Lead (Pd), Zinc (Zn). The received results show: variation of the percentage of dry material /from 92,12% to 4,03%/ according to the technology of storage. The way of storage has no essential influence on the content of carbon in the various stable fertilizers, where pig manure has the highest value of nitrogen in all technologies of storage. Near to the recommendable optimal values of C:N is stayed/dry/ and fresh/hard/ in all three fertilizer types. The technology of storage by the different manure types has no influence on the content of heavy metal. Exception can be observed as far as the zinc content in stale /fluid/ pig manure is concerned. High content of dry material can be observed in bioshlam received from clearing station. In both ways of production of variation in the content of dry material the ratio between the biogenic macro elements C:N remains. The free nitrogen forms (N-ammonium and Nnitrate) in bioshlam are higher to other organic waste in both technologies of storage. No values over the critically admissible in bioshlam are observed in both technologies of production.

№ 42. Baykov B. D., **Shindarska, Z**., Kirov,V., Kostadinova, G., Increasing the effectiveness of a holding company for organic cow milk production by using new biogas substrate, XVIth International congress on Animal Hygiene, 2013, page 385-387

Up until now, studies on the production of biogas from manure have shown the prospects of this biotechnology as an opportunity for utilization of the energy in waste biomass as well as an opportunity to obtain a decontaminated product /compost/ with an optimal chemical composition / macro- and micronutrients content, quantity of water-soluble fractions / to improve soil fertility. This paper presents a model of a holding company for organic cow's milk production and energy from a renewable energy source – a mixture of manure and energy crops; for the first time the possibility of integrating two types of biotechnology (lactic-acid fermentation) and anaerobic decomposition of the substrate which includes silage from Paulownia elongata is being considered.

№ 43. **Shindarska, Z**., Kirov V., Popova T., Baykov B., New materials for biogas production in livestock farms in Bulgaria, XVIth International congress on Animal Hygiene, 2013, ISAH, China, page 388-390

A comparative study was conducted for the production of biogas utilizing raw materials that are new for Bulgaria. The study included three types of beetroot: sugar beet, red beet and fodder beet in two variants. First variant: heads + leaves, Second variant: heads. For all the raw materials the following content was determined: dry matter, organic matter, nitrogen and crude ash (minerals content, including some toxic elements). The results of the analysis show that the highest values of dry matter were found in sugar beet in both variants: 20.61% and 28.12% respectively. In terms of organic matter content, the tendencies of higher values in sugar beet remain (13.51% and 26.21% respectively for both variants). Nitrogen content is highest in fodder beet – 2.48% and 1.90% respectively for both variants, and it is the lowest in sugar beet – 1.65% and 1.30% respectively for both variants. A tendency for higher crude ash content in fodder beet is observed; the content of toxic elements such as cadmium and lead are highest in both variants. Sugar beet stands out with best values for each indicator characterizing the production of biogas.

№ 44. Popova, T., B. Baykov, **Z. Shindarska**. Study on decontamination of silage from Paulownia elongata. Proceeding of XVIth ISAH Congress 2013 "Animal Hygiene, Health and Welfare as Corner Stones of Sustainable Animal Production", International Society for Animal Hygiene, Nanjing, China, May 5 – 9, 2013, 278-280

Studies for the presence of pathogenic microflora and for the time of decontamination of ensiled and fresh leaf of Paulownia elongata were carried out. For this purpose changes in

the quantities of microorganisms contained in the material, as well as of pathogenic test strains of Proteus vulgaris, Pseudomonas aeruginosa and Staphylococcus epidermidis, differing in resistance to gentamicin and tetracycline antibiotics were tracked. Test bacteria were introduced into silage and foliage in quantities of 105 CFU/g of the total content.

It was found that the microflora of leaves of P. elongate is presented principally by cocci and bacilli. E. coli, Salmonella enterica and Clostridium perfringens were not isolated. In silage were found mainly lactobacilli. The imported Pseudomonas aeruginosa survived in the silage 3 days and the test strains from other species - 10 days. The test bacteria remained longer in the fresh leaves within 3 to 4 weeks. The ensilaging provides fast and safe decontamination of leaf of P. elongata. Use of such silage for feeding of animals is safe from epidemiological perspective.

№ 45. Popova,T., B. Zaharinov, M. Kaleva, B. Baykov, **Z. Shindarska**, Reduction of microorganisms in thermophilic process of anaerobic digestion of catle manure, 2013, International Journal of current Microbiology and Applied Sciences, 2, 12, 653-660

The changes in the quantities of microorganisms during continuous thermophilic anaerobic digestion of cattle manure at 45+1,5oC were studied. Test strains (TS) of Pseudomonas aeruginosa and Staphylococcus epidermidis, resistant to antibiotics from the groups of amphenicols and tetracyclines, were used. They were introduced in the material in quantities by 106 CFU/ml of its content. After 5 days TS of P. aeruginosa disappeared in the bioslime. By the 55th day of the experiments Escherichia coli disappeared too, and the amounts of the TS of S. epidermidis and of the other microorganisms monitored, which include pathogenic species such as coliforms, Enterococcus sp., Clostridium perfringens and S. epidermidis decreased to minimum values of 102-103 CFU/ml. Similar amendments were established and in parallel conducted analogous experiment mesophilic process of anaerobic digestion of the same manure, but to a lesser degree.

№ 46. Mehmedov T., **Z. Shindarska** and M. Krasteva. Effect of probiotics Clostat and Laktina over pheasants for resettlement. Bulgarian Journal of Agricultural Science, 19 (No 1) 2013, 163-169

The aim was to determine the effect of probiotics CloSTAT and Laktina in pheasants for resettlement. The probiotics CloSTAT was in a dose of 0.5 g/kg forage and Laktina - in a dose of 0.5 g/l water. The experiment continued 90 days (from the day of pheasants' incubation). Every day during the experiment was controlled the dynamics of weight growth, the consumption of forage, the received energy and nutritive substances and the state of health. The utilization of food and the received sub - stances was determined based on the controlled indexes. It was determined a higher growth of the experimental groups, better utilization of forage, energy and nutritive substances toward the control one during the grower

period.

№ 47. Popova, T. P., B. D. Baykov, **Z. Shindarska**. Comparative testing of effect of ammonium phosphates for decontamination of cattle manure. Archiva Zootechnica 2013,16:1, 89-97

Comparative studies of the application of monoammonium and diammonium phosphate for processing of fresh and aged manure litter from dairy cows were carried out with a view to decontamination. For this purpose changes in the quantities of pathogenic test strains of Proteus vulgaris, Pseudomonas aeruginosa and Staphylococcus epidermidis, differing in resistance to gentamicin and tetracycline antibiotics, were tracked. They were imported in the materials in quantities by 105 CFU/g of their total contents at the beginning of composting. It was found that in all investigated variants even after 2 weeks of the beginning of the experiments the quantities of test bacteria decreased to negligible levels (less than 2 lg). Complete decontamination of the studied composts in terms of pathogenic test bacteria was achieved in period of three weeks at temperature above 20°C. There were no significant differences of the antimicrobial effect between both nitrogen compounds tested (P>0.05), although diammonium phosphate showed slightly better results in this direction. Higher doses (600 ppm) also did not show statistically significant differences compared with smaller concentrations (200 ppm). In fresh and aged cattle manures without chemical treatment complete decontamination with respect to the introduced test strains was achieved for four weeks.

№ 48. Veselin Kirov, **Zaprianka Shindarska**, Gergana Kostadinova, Adelina Gencheva, Stojan Hadgiev, Toncho Penev and Bayko Baykov, Comparative study of new energy crops for the production of biogas, International Journal of Current Microbiology and Applied Sciences, ISSN: 2319-7706, Volume 3 Number 11 (2014), page 181-188

A comparative study of new energy crops has been conducted. Its aim was to give a comparative assessment of the main technological parameters for biogas production. Samples of the following energy crops were examined: four species of Paulowniahybrid, Shan Tong, Kawakamii and Elungata, Willow, Miscanthus and Arundo. The examined energy crops have optimum values of the main technological parameters in the production of biogas/dry matter, organic matter, carbon, nitrogen and the C:N ratio.

№ 49. **Zaprianka Shindarska**, Geargana Kostadinova, Stoian Hadjiev, Adelina Gencheva, Botjo Zaharinov, Teodora Popova, Veselin Kirov, Georgy Tivchev, and Bayko Baykov, Co-digestion of waste activated sludge and silage mix of chicken litter and fodder beet, International Journal of Current Microbiology and Applied Sciences, ISSN: 2319-7706,

Volume 3 Number 3 (2014), page 991-998

In order to determine the yield of methane in a Co-degradation study with different substrates. The study involved the following substrates : WAS only; WAS+silage 2:1; WAS+silage 1:1; WAS+silage 1:2. Studieed is the contents of the macro and micronutrient in the tested substrates and biogas yield after methane fermentation. It was found that major disadvantage of the BMP test is the fact that it does not provide short-term results because of its duration, methane yield during a shorter period could be predicted by evaluating the reaction rate provided by the rate constant.

№ 50. Arnaudova-Matey A., I. Todorov, K. Todorova, D. Dimitrova, T. Mehmedov, **Z. Shindarska**, S. Ivanova, G. Angelov, P. Dilov. Tolerability and subchronic toxicity of iron methionate in broiler chickens compared to ferrous sulphate. Journl of animal science. 2014,3, 31-40

Bulgarian iron methionate (Fe-met.) containing 13.3% iron was studied in comparison to sulphate (Fe-S) (heptahydrate) containig 20% iron. 40 broiler chickens aged 20 days and 55 chickens aged 10 days of both genders equally divided, four linear hybrids ROSS-IKOV, involved in the study. The basic feed used for all chickens during the tests was a blend of grain soya which contained 2,717.23 kcal/kg metabolizable energy, 21.33% crude protein, 119 ± 5 pprr and vitamin and mineral blend without iron. In the 20 day-old chickens the comparable products w applied intraingluvialy. The following results were achieved: LD0 for Fe-met.- 1.500 mg/kg and Fe-S - 1,000 mg/kg; LD0S for Fe-met.- 2.000 mg/kg and for Fe-S - 1.500 mg/kg. The two pr had low acute toxicity. The chickens aged 10 days were included in 35-day subchronic toxicity 40 ppm and 300 ppm Fe-met. and Fe-S were added to their food. During the study no chickens got or had any manifestations of adverse side effects and pathomorphological changes. No changes in haemoglobin level associated with the source of iron or control chickens were observed. However, found differences in the effect of the products in question and in the control chickens (weight, n of leukocytes, total protein) in favour of the iron methionate, which were probably due to the bioactivity.

№ 51. Popov G., I. Ralchev**, Z. Shindarska**. Condition, trends and prospects for development of dairy farming in Bulgaria. 2014. "Tradition and Modernity in veterinary medicine" Yundola 28-30.11.14 (in press)

Studied and analyzed the statistical data on the state of dairy farming in Bulgaria during the period 2002 – 2012. The findings were used as the basis for outlining the trends of development of the sector and the resulting complex approaches to solving problems.

Statistics show a drastic reduction in the total number of cattle in the course coincides with the restructuring of the sector and the introduction of new requirements regarding the quality of products manufactured in accordance with European directives.

It was found that during the period 2011 - 2012 the number of farms, which grow from 1 to 9 cows decreased by 21.5% and the number of animals by 5.9%. The reason for this is the limited financial resources do not allow making the necessary investments to the new requirements. In 2012 was observed an increase in the number of farms with more than 100 cows, the number of cows in them reached 43 500 (1.4% increase over the previous year or 15% of the total number of dairy cows in the country).

On the basis of the analyzed data can draw the following conclusions:

- Key prospects for development of dairy cattle is currently financial contributions from EU programs, and for 2012 - 2014, these funds should increase on average by 10%, which is leading factor for farm consolidation. Financial assistance is to improve the facilities on farms, buildings, productive and reproductive performance of breeding animals and tribal work.

- Obtaining quality produce from farms is done by categorizing them on certain criteria.

№ 52. Arnaudova-Matey, **Z. Shindarska**, T. Yankovska, T. Kirilova, D. Dimitrova, V. Dilova, T. Todorov, S. Ivanova and T. Mehmedov. 2015. Influence of the ferrous methionate and ferrous sulphate on some productive indices in broiler chickens. Bulgarian Journal of Agricultural Science, 21 (№1), 225-229

Comparative study of the iron methionate (Fe-methionate) and ferrous sulphate (FeSO4) contained in the liver of broiler chickens aged 10 days was conducted. The aim of this test was to establish the effect of the two levels of iron methionate and ferrous sulphate (40ppm and 300ppm) on some production traits and the deposit of iron in the liver. The rheological studies conducted with the products FeSO4 (heptahydrate), iron methionate and Bioplex iron were aimed to explore the opportunities to mix these products with the feed. The above-mentioned products were analysed by using atomic absorption method, which showed that the iron methionate contained 13.3% iron and 34% methionine and the ferric sulphate produced by the company Merck contained 20% iron. We found that the rheological performance (angle of repose, flow rate, Hausner ratio) was better in the organic products (iron methionate and Bioplex iron) compared to that of the ferrous sulphate (heptahydrate), which was a condition for better mixing with the feed.

In terms of the chicken weight and feed convention at a basic iron in the mixtures of 119,5 ppm and additive of 40 ppm and 300 ppm iron methionate or ferrous sulphate the trends were in favour of the organic product, but, however, the differences were unreliable.

The iron methionate deposited more iron in the chicken liver compared to the ferrous sulphate, as the differences were reliable ($P < 0,05$).

№ 53. Mehmedov T., E. Gyurova, St. Radanski and **Z. Shindarska**, 2015. Influence of probiotics Clostat® and Lactina® on the quality of meat of pheasants. Scientific works. Ser. C: Veterinary medicine, vol. LXI (1), ISSN 2065-1295, 239-245

Probiotics are widely accepted as an alternative to the nutritive antibiotics in poultry production as opposed to farm breeding pheasants.The aim of the study was to investigate the influence ofprobiotics CloSTAT® and Laktina® on meat quality of 90 day-old pheasants. The experiment was conducted with 90 newly hatched pheasants (Phasianus colchicus colchicus), divided into 3 groups of 30 birds in each group, floor breeding with free access to food and water for 90 days. The three groups were fed with a standard compound feed for pheasants ad libitum, for the experimental groups as follows:for the second group (group B) probiotic CloSTAT® (0,5 g/kg feed) was added; and for the third group (group C) probiotic Laktina® (0,5 g/l of drinking water) was added. After completion of the experiment from each group were slaughtered 5 pheasants for meat sampling of the breast and leg. The following indicators were analysed: pH 24h post mortem, the water holding capacity, colour of the meat, content of myoglobin, protein and ash content. The results of the experiment showed that the use of the probiotics CloSTAT® and Laktina® increases the pH of the breast muscle, lightens the colour and decreases the myoglobin content in the leg and breast muscle, increases the water and mineral content in the leg muscle. The probiotics impact the protein metabolism in leg and breast muscle in different ways. The use ofprobiotic Laktina ® leads to the accumulation of a larger amount ofproteins in the breast muscle, and the use of CloSTAT® - reduces their amount in the leg muscle.

№ 54. Ignatova M., **Z. Shindarska**, Y. Iliev, 2015, Testing the effect of probiotic Lactina® in feeding calves, Journal of Animal Science, LII, 4, 11-16

In order to test the effect of probiotic Lactina experiment is held with calves of Simmental breed in suckling period. It is established final live weight (with 5.6%) and average daily gain in calves receiving the probiotic, the values are more pronounced until the 30th day of the experiment. There is also a higher consumption (with 4.6%) expense of the starter mixture and hay. The results of microbiological studies of feces showed a decline in the total number of microorganisms (with 12.3%) and the number of coli- forms (with 42.6%) in the experimental group compared with the control one. It is established reducing digestive disorders in calves who received probiotic Lactina with the milk replacer.

№ 55. **Shindarska Z**., S. Savvidou, N. Kasandrinos, G. Popov, 2015. European and national legislation of bulgaria and greece for the “safety and quality of animal feed”: a review. Journal of animal science (in press)

Study of European and national legislation of Bulgaria and Greece related to "Food safety and animal feed" is held. The study included legislation regulating the presence of mycotoxins, alkaloids of plant origin, inorganic contaminants in foodstuffs and genetically modified plants used as feed, as well as regulations for their control.

№ 56. **Zapryanka Shindarska**, Georgi Popov and Iliya Ralchev. 2016. Influence of Age at First Calving on Milk Quantity at Holstein-Friesian Cows. Int.J.Curr.Microbiol.App.Sci. 5(3): 254-259

A study has been held in two farms (A and B) with cows of Holstein-Friesian breed. The farms included in the study are divided in diet and breeding. The animals were divided into groups according to age at first calving. The age of first calving for each group in the two farms has been traced. This study aims to track the age of first calving in cows of Holstein-Friesian breed and milk quantity on first lactation in both farms. The survey results indicate an optimal age for first calving at Farm A - 24 months of age, and for Farm B - 29 months of age. In the respective ages the total milk is highest.

№ 57. Georgi Popov, **Zapryanka Shindarska** and Iliya Ralchev. 2016. Reproductive and Productive Indicators of Holstein-Friesian Cows Grown in Cubical Technology Int.J.Curr.Microbiol.App.Sci. 5(4): 287-296

Reproductive and productive performances of Holstein - Friesian cows grown at cubic technology were studied. The study included 70 animals separated and aligned into groups according to number of lactation. The following reproductive parameters are traced: age of fertilization, age of calving, length of periods from calving to first heat and from calving to fertilization, number of inseminations, duration of pregnancy and calving period. From the productive parameters are researched: milk quantity for lactation, duration of lactation and dry period. The aim of the study is to establish productive and reproductive performances in Holstein-Friesian cows, at different lactation placed under the same technological conditions of feeding and breeding. The obtained results shows: extended duration for first, second, third and fourth lactation (respectively 347, 304, 326 and 316 days), increased number of insemination to fertilization (1,79; 1,39; 1,71 and 3,25 for each lactation), increased age of calving (35,5; 45,8; 60,7 and 73,2 months), extended period from calving to first heat (100,1; 81,6; 64,6 and 42,7 days), from calving to fertilization (141,6; 102,3; 126,7 and 125,7 days) and calving period (420,7; 381,4; 405,4 and 401,7 days) for the four lactations respectively.

№ 58. Popov G., V. Kirov, K. Razos, **Z. Shindarska.** 2016. Quality and safety of feed used in feeding cattle. International scientific conference "Tradition and modernity in veterinary medicine" 01 – 03.04.2016, BULGARIA. (in press)

This article addresses issues related to the quality and safety of feed and additives used in the feeding of cattle. The indicators characterizing the quality of feed - dry matter, energy, crude protein, digestible protein in the intestine, balance of protein in the rumen, calcium, phosphorus and raw fiber are described. Questions related to the requirements of dairy cows on their need for nutrients and levels of certain undesirable substances in feed (chemical, microbiological and physical) are reported. Legal norms and regulations concerning the

quality and safety of food are considered and the influence of some genetically modified plants used as food for cattle are viewed.

№ 59. Popov G., **Z. Shindarska**, I. Ralchev. Study of productive and reproductive parameters in cows from holstein-friesian breed. Jubilee international conference "Animal Science - Challenges and Innovations"4 November to 6 November 2015. Journal of animal science (in press 2016)

A study was conducted with cows of Holstein-Friesian breed. It includes 152 number of animals separated and aligned into groups according to sequence and number of lactations. We trace the following reproductive parameters: age of mating, calving age, length of service and independents period, number of insemination, duration of pregnancy and calving period. Parallel to this are investigated some productive parameters, such as milk quantity of lactation, duration of lactation and dry period.

The aim of the study is to establish some reproductive and productive performance of dairy cows with different lactation placed under the same technological conditions, feeding and breeding.

It was found extending lactation than optimal (305 days), increasing the number of insemination for breeding, increase the age of calving and extending the service and calving periods.

№ 60. Slavkova S., **Z. Shindarska**. Condition of meadows and pastures in bulgaria and tendencies for their development. 2016. Journal of animal science. (in press 2016)

The present article is a survey that observes the condition, tendencies and development of meadows and pastures in Bulgaria. A detailed review and analysis were made on the condition of the natural meadows and pastures. Deterioration was found in both of them in the botanical composition and the yield per decare. The yields from the main forage crops were analyzed, which were used as green matter, as well as those from the hay and silage production. Reduced areas and yields of forage crops were found. The tendencies were outlined and recommendations were made for their development on the basis of analysis, with a view to be used fully and to improve their botanical composition, the nutritional value and productivity. The conservation and development of the meadows and pastures is essential for the development of the ruminant livestock.

Учебници и учебни помагала

№ 1. Байчев Ж., П. Първанов, Ив. Николов, М. Събев, З**. Шиндарска.** 2007. Изкуствено осеменяване и андрология на с.с. животни. Учебник за студенти по ветеринарна медицина. ISBN: 978-954-8319-46-1

Учебника „ Изкуствено осеменяване и андрология на домашните животни" е предназначен за студенти от специалността „ Ветеринарна медицина". Може да бъде ползван и от други специалисти занимаващи се с биотехнологиите на изкуственото осеменяване и репродукцията на с.с. животни.

Учебника включва последните научни постижения в областта на изкуственото осеменяване и андрологията на с.с.животни , птици и риби. Включени са въпроси засягащи патологията на органите на размножаване при разплодниците.

В гл.V са разработени основните и актуални въпроси свързани с храненето и отглеждането на различните видове разплодници, използваните фуражни добавки и практика на хранене. Автор на тази глава е доц.д-р З.Шиндарска.

№ 2. Тодоров Н., **З. Шиндарска** и кол. 2010. Практикум по хранене на животните. ISBN: 978-954-321-733-5

Основната цел на практикума е да улесни практическото обучение на студентите по различните дисциплини свързани с храненето. – Основи на храненето, Приложно хранене на отделните видове и категории продуктивни животни, Хранене на домашни любимци, Хранене на дивеча и животни за ценни кожи.

В практикума са дадени по-голям брой единици, отколкото са включени в учебната програма на студентите по ветеринарна медицина, което позволява да се задоволят интересите по-широк кръг специалисти.

Практикума е необходимо помагало за практикуващи ветеринарни лекари, мениджъри на ферми, химици, учените работещи в област" Аграрни науки и ветеринарна медицина". В него се включват официално приетите методи за анализи и стандартите използвани в лицензирани лаборатории.

Практикумът е колективно дело, с участие на много автори. Автор на раздели: 7.1, 8.3,8.7 до 8.9 е доц**.** Шиндарска.

№ 3. Тодоров Н., Д. Гиргинов, **З. Шиндарска**, А. Илчев, Д. Пенков. 2011. Хранене на животните. ISBN: 978-954-305-310-0

Настоящия учебник е написан в съответствие с актуалната програма за обучение на студенти от специалност „ Ветеринарна медицина" по дисциплината „ Хранене и агрономия". Разглеждат се основни въпроси , позволяващи да се организира правилно и здравословно хранене на животните.Впървата част са разгледани хранителните

вещества и тяхното усвояване от животните. В тази част автор на гл.5 Минерални вещества е доц.д-р З.Шиндарска.

Във втората част са описани основните фуражи, храни и добавки , които се използват при хранене на животните, хранителните вещества, които осигуряват и специфичното им влияние върху здравето и продуктивността на животните. Третата част е специалното хранене на различните видове и категории животни, методите за балансиране на техните дажби, с оглед получаването на висока, качествена и икономически изгодна животинска продукция. В тази част гл.6.Хранене на овце и кози, гл.10.Хранене на зайци, и гл.17. Хранене на животни за ценни кожи са дело на доц.д-р Шиндарска.

Информацията в учебника е съобразена с последните новости на науката по хранене и практическите достижения в практиката.

№ 4. Байчев Ж., П. Първанов, И. Николов, **З. Шиндарска**, Д Димитров, К. Христов. 2013. Ръководство за лабораторно-практически занятия по изкуствено осеменяване и андрология на домашните животни, птици и риби. ISBN: 978-954-8319-65-2

Ръководството е предназначено за практическа подготовка на студенти по ветеринарна медицина и е съобразено с учебната програма. Може да се ползва и от студенти по Зооинженерство и да бъде полезно за специалисти, работещи в областта на репродукцията при селскостопанските животни.

В ръководството за лабораторни и практически занятия по „Изкуствено осеменяване и андрология на домашните животни, птици и риби" са отразени редица нови достижения в областта на изкуственото осеменяване на селскостопанските животни. Разглеждани са в съответна последователност въпроси свързани с морфологията на половите органи при разплодници, получаване, оценка и съхраняване на сперма, както и репродуктивните биотехнологии за изкуствено осеменяване на женски животни.

В ръководството е включена глава „ Хранене на животните и влияние върху репродуктивните процеси. Тази глава е разработена от доц. д-р З. Шиндарска.

Научни помагала с приложен характер

№ 1. Станчева Й., **З. Шиндарска**. 2008. Наръчник на предприемача в биологичното земеделие. Глава 9. Фермерско отглеждане на животни за ценни кожи – нутрия, чинчила и норка. Авангард прима, ISBN 978-954-323-453-0, 129-142

Наръчникът на предприемача в биологичното земеделие е опит за всестранно и многопосочно разглеждане на отделните структурни елементи на екологичната

производствена единица в тяхната взаимна зависимост и обусловеност.

Книгата съдържа теоретична част, в която са разгледани причините за възникването на биологичното земеделие, спецификата на основните видове екологични земеделски системи и общите биологични основи, върху които те се изграждат.

В практическата част на книгата са разгледани технологиите на подходящите за екологично отглеждане най-важни полски, зеленчукови, трайни, лечебни и други култури. Посочени са изискванията и методите за екологично отглеждане на основните видове домашни животни, медоносната пчела, копринената пеперуда, както и възможностите за отглеждане на животни с ценни кожи. Обърнато е внимание върху технологията за получаване на екологични фуражи, необходими за изхранване на животните в екологичното животновъдство. Разгледани са някои съпътстващи дейности, които дават възможност за максимално използване на ресурсите на средата и безотпадно функциониране на екологичната земеделска ферма, каквато е гъбарството. Разгледани са някои критични елементи от технологиите в биологичното земеделие, каквито са запазването на хранителния баланс без употреба на минерални торове, екологичните системи за поддържане на почвената повърхност и контролът върху вредителите. Посочени са възможностите за съхранение и преработка на продуктите, получени в екологичната земеделска ферма. Специално внимание е отделено на възможностите за изграждане и кредитиране на земеделската екологична ферма.

В глава 9. Фермерско отглеждане на животни за ценни кожи с автор доц. д-р З.Шиндарска се представя актуална информация за възможностите за екологично отглеждане на животни с ценни кожи - нутрия, чинчила и норка. Посочени са норми и схеми на хранене на тези животни, както и видовете фуражи и храни за тези животни.

Книгата би събудила интерес сред всички, които имат положително отношение към приложната екология и са заинтересовани от изграждането на устойчиви, продуктивни и икономически ефективни биологични земеделски стопанства.

№ 2. **Шиндарска З.,** А. Кирилов и Е. Василев. 2013. Ливадите и пасищата – важен фуражен ресурс за България и страните от ЕС, Издателска къща при ЛТУ – София.

В настоящето помагало се разглеждат въпросите свързани с многофункционалната роля на ливадите и пасищата. То е предназначено за стопани, които използват и стопанисват ливадите и пасищата. Целта на учебното помагало е да даде актуална информация за състоянието на ливадите и пасищата у нас, както и да посочи начините и методите за възстановяване, поддържане и стопанисване на ливадите и пасищата. В учебното помагало е посочена актуална информация за състава и хранителната стойност на ливадите и пасищата у нас. Направена е препоръка за време на косене и прибиране при производство на сено, както и мерките за финансиране при стопанисване и използване на ливадите и пасищата. Екологичното значение на пасищата е безспорно и по тази причина в последните години им се отделя заслужено

внимание. Системата им на управление е обект на държавни и политически решения. Поддържането им се регулира чрез ангажиране на ползвателите със спазването на определени изисквания при тяхното стопанисване и преки субсидии за поддържането им. Пасищата като източник на фураж са обект на постоянни изследвания: в агрономически аспект - продуктивност, ботаничен състав на тревостоя и промени; в зоотехнически - промени в химичния състав и хранителната стойност на тревостоя и влияние върху продукцията от животните; от ветеринарно естество - санитарно състояние, наличие на паразити и предаването им върху пасящите животни, заразяване на фуража с микотоксини или отровни треви. В съвкупност тези показатели на пасището имат отношение общо към качеството на фуража и хранителните продукти от животински произход или за оцеляване на дивите тревоядни животни.

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Изготвил:

/доц. д-р З. Шиндарска/