

THE EFFECTS OF DROUGHTMASTER CATTLE GENETIC RESOURCES ON THE GROWTH PERFORMANCES OF THEIR CROSSBREDS IN THE WESTERN HIGH LAND

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The major objectives were to evaluate the body weight, average daily gain, as well as the impact of Droughtmaster bovine proportion on body weight and gain weight of their crossbreds raising in Western High Land. Total of 584 calves in Gia-Lai (230 calves) and Dak-Lak 381 calves) of 8 breed groups including Local Yellowcattle, Red Sindhy crosses and Droughtmaster's crossbreds with 320 females and 264 males, derived from 138 holds were investigated for data collection. Proc GLM in SAS 9.4 was used for data analyses. Proc Reg with first order linear regression models were applied to estimate the increment of body weight and gain weight of breed groups. The results indicated that beef crossbreds upgraded with Droughtmaster genome on both Indigenous and Red Sindhi crossbred cows may be well developed in Western High Land. However, crossbreds based on Red Sindhi crossbreds gave the higher body weight and gain weight than crossbreds based on Local Yellow cows. When proportion of Droughtmaster genome in crossbreds increased, their body weight and daily gain were both enhanced. Crossbreds with 50% of Droughtmaster genome got the body weight from 352.06 and 412.49 kg at 18 and 24 months old, respectively. Crossbreds with 75% of Droughtmaster genome got the body weight from 374.26 and 436.17 kg at 18 and 24 months old, respectively. It is concluded that Droughtmaster genome affected favourably growth performance in beef cattle and it was suitable with crossbreeding for beef cattle. Crossbreds with Droughtmaster genome at 50% were better in accordance with fattening systems in Western High Land.

Keywords: *Genetic resources, Droughtmaster cattle, Body weight, Average daily gain.*

SOME CHARACTERISTICS OF APPEARANCE AND REPRODUCTIVITY OF THANH CHUONG BUFFALO, NGHE AN

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Thanh Chuong buffalo is a swamp type and valuable livestock genetic resource of Thanh Chuong district, Nghe An province. The survey was conducted to determine on the current situation of Thanh Chuong buffalo from May 2021 to May 2022 in Thanh Chuong district, Nghe An province and in Mountainous Animal Husbandry Research and Development Center, Thai Nguyen province, in order to evaluate the appearance and some reproductive characteristics of Thanh Chuong buffaloes. The appearance characteristics of 400 adult buffaloes are directly observed and recorded. Reproductive characteristics of 200 female reproductive female buffaloes are collected through investigation and interviewing the owner of buffalo farming. Some characteristics of buffalo semen are directly studied on 5 male buffaloes raised in Thai Nguyen in the fall, winter and spring. The results show that Thanh Chuong buffaloes mainly have ash-gray hair and black skin. The Thanh Chuong buffalo has quite characteristic features such as white hair color around the eyes, white hair color forming a semicircle at the breast and neck, white hair on the legs, the proportion of buffalo with this characteristic accounts for 85-99%. Buffalo horns are mainly semicircular in shape. Thanh Chuong buffalo has the age of first estrus at 28.5 months, the age of first mating at 30.4 months, the average age of first calving at 41.4 months. In the literatures, the indicators of reproductive characteristics are quite low compared to buffaloes in some other locations. First estrus weight was 312.5 kg, first mating weight was 341.9 kg, first calving weight of Thanh Chuong buffalo was 408.7 kg/head. Calving interval 16.8 months. The semen quality of 5 male buffaloes was tested and evaluated in 3

seasons (Autumn, Winter and Spring). The results did not find any statistically significant difference for the indicators of abnormality ratio and pH of the sperm of buffalo. However, the highest volume of ejaculate in spring (3.42 ml), the amount of ejaculation in autumn and winter did not differ significantly (3.08 ml and 3.29 ml, respectively). Sperm motility was highest in spring (80.82%), between autumn and winter, there was no difference. Similarly, sperm concentration was also highest in spring (974 million/ml), while in autumn and winter there was no difference in sperm concentration (916 and 907.8 million/ml, respectively).

Keywords: *Thanh Chuong Buffalo, appearance, reproduction, semen*

CREATION OF GP LINE ON THE BASIS OF GENE EXCHANGE BETWEEN FRENCH AND AMERICAN LANDRACES AND BREEDING THROUGH 3 GENERATIONS

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The experiments were conducted to evaluate the process of self-crossing to select and create a GP line on the basis of gene exchange between Landrace pigs imported from France and from the USA. Two pig groups of LVN1 (♂ French Landrace x ♀ American Landrace) and LVN2 (♂ American Landrace x ♀ French Landrace) were bred and selected through 3 generations. Results show that LVN2 pigs were selected as the GP line with the following main performances: In the growing period, ADG was 862.75 g/day, the lean meat was 59.71% and FCR was 2.47 kg. The semen quality of boars was 52.11 (billion/ time) in VAC. The reproductive performance: NB, NBA and NPW were 13.84; 12.65 and 12.22, respectively; The average weights of piglets at birth and weaning were 1.46 and 6.59 kg, respectively; the number of weaning piglets/sow/year was 28.47. The GP line of LVN2 meets the demands of our country's livestock production.

Keywords: *Landrace, gene exchange, breeding, creating GP line.*

CREATION OF GP LINE ON THE BASIS OF GENE EXCHANGE BETWEEN FRENCH AND AMERICAN YORKSHIRES AND BREEDING THROUGH 3 GENERATIONS

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The experiments were conducted to evaluate the process of self-crossing to select and create a GP line on the basis of gene exchange between Yorkshire pigs imported from France and from the USA. Two pig herds of YVN1 (♂ French Yorkshire x ♀ American Yorkshire) and YVN2 (♂ American Yorkshire x ♀ French Yorkshire) were bred and selected through 3 generations. Results show that YVN2 pigs were selected as the GP line with the following main performances: In the growing period, ADG was 859.47 g/day, the lean meat was 59.83% and FCR was 2.46 kg. The semen quality of boars was 53.44 (billion/ time) in VAC. The reproductive performance: NB, NBA and NPW were 13.47, 12.59 and 12.20, respectively; The average weight of piglets at birth and weaning were 1.43 and 6.58 kg, respectively; the number of weaning piglets/sow/year was 28.42. The GP line of YVN2 meets the demands of our country's livestock production.

Keywords: *Yorkshire, gene exchange, breeding, creating GP line.*

DETERMINING CRUDE PROTEIN AND METABOLIZABLE ENERGY LEVELS IN DIET FOR HUBA LAYING DUCK

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The purpose of the study was to determine the appropriate crude protein and metabolizable energy levels for breeding ducks Huba. This study was conducted to determine the dietary CP and ME for optimal reproductive performance of Huba laying ducks. Using a 3x3 factorial arrangement of treatments, 972 ducks (810 females and 162 males) Huba laying duck breeders at 22 weeks of age were randomly assigned to experimental diets of 2800 (HME = high ME), 2700 (MME = medium ME), or 2600 (LME = low ME) kcal of ME/kg, each containing 19% (HCP = high CP), 18% (MCP = medium CP), or 17% (LCP = low CP) CP. Each dietary treatment included 3 replicates of 36 birds each. Results of experiment revealed that optimal concentrations of ME and CP in completed feed for Huba laying ducks were 2700 kcal/kg and 17.0% respectively. Compared among ducks fed the LCP, HCP and MCP diet, the egg production was not significantly different, compared with ducks fed the MME diet, the egg production was higher in ducks fed LME and not significantly different in ducks fed HME. Interactions were detected between ME and CP levels in egg production, and feed cost as the MMExLCP diet was the best ($P < 0.05$). At the treatment MMExLCP, egg production/hen/28 weeks of laying, FCR per 10 eggs, fertilized egg rate, type 1- chicks /hatching rate and hatching rate/total egg input were reached 120,60 eggs, 3.22kg, > 94%, > 82% and > 77%, respectively.

Key words: *Egg production, hatching rate, energy and protein requirement and Huba laying ducks.*

EVALUATE THE ACTIVATION PROCESS OF 3 LACTIC ACID BACTERIA STRAINS ON THE INDUSTRIAL SCALE

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Research aims to evaluate the activation process of 3 lactic acid bacteria strains on an industrial scale to successfully produce probiotics containing lactic acid bacteria with high applicability in livestock to minimize antimicrobial resistant of infection bacteria. The activation process was evaluated by diffusion test, lactic acid production and bacteriocin activity. Through the study, we evaluated the activation process of 3 strains of Lactic bacteria. Specifically in all 3 strains of *Lactobacillus plantarum* UL485; *Bifidobacterium animalis* NG52 and *Pediococcus pentosaceus* PT 16.9 were investigated, all strains have good inhibitory ability and lactic acid content is >13g/liter and bacteriocin activity >1.000AU/ml, proving that the strains have been well activated and can be used for further procedures.

Keywords: *Bacteria, Lactic, Lactobacillus plantarum UL485; Bifidobacterium animalis NG52 và Pediococcus pentosaceus*

STUDY ON THE PREVALENCE OF ROUNDWORM INFECTION IN THE GASTROINTESTINAL TRACT IN CATS AND DOGS IN VIET YEN DISTRICT, BAC GIANG PROVINCE

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To advise farmers to see the risk of humans being infected with parasitic roundworms in dogs and cats. Thereby raising awareness for breeders about effective diagnosis, prevention, and treatment of diseases in dogs and cats,

contributing to protecting public health. We investigated and determined some characteristics of the infection rate of roundworm species in domesticated dogs and cats in Viet Yen district, Bac Giang province from August 2021 to May 2022. Random sampling and multi-level cluster sampling were used in this study to collect dogs' and cats' feces samples. Next, Wisconsin sugar centrifugal floatation technique and McMaster egg counting method were applied to examine and identify roundworm eggs in the feces. Research results on 423 samples of dog and cat feces collected in 6 communes of Viet Yen district (Viet Tien, Huong Mai, Tu Lan, Minh Duc, Quang Minh, and Bich Dong town), Bac Giang province showed that the overall prevalence of gastrointestinal roundworm infection in dogs is 43.56%. That rate in cats is 39.90%, with diagnostic results by the sugar floatation technique. Based on the morphology and size of roundworm eggs, 3 species of roundworms parasitic in the intestinal tract of dogs and 2 species in the intestinal tract of cats were detected. Under 2-month-old dogs and cats have the highest gastrointestinal roundworm infections. Domestic cats and dogs have a higher rate of roundworm infection than other breeds. Dogs and cats raised by free-range farming have the highest rate of gastrointestinal roundworm infection.

Keywords: *Dog, cat, roundworm, Bac Giang province.*

CURRENT STATUS AND ORIENTATION OF SCIENTIFIC RESEARCH IN LIVESTOCK INDUSTRY

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The Agriculture and Rural Development sector in recent years has implemented the plan in the face of many difficulties and challenges, especially the price of input materials, especially feed, increased by 30-40%. However, the agriculture sector in general, and the livestock industry in particular, with an appropriate industry development strategy, the Ministry of Agriculture and Rural Development along with other ministries, sectors and localities have implemented close to reality, so by 2022, the entire agricultural sector will be exported. will reach 55 million USD. In which, livestock still maintained development at 4-6% rate; production value increased from 20.35% to 25.2% compared to the proportion in agriculture. The achievements of the livestock industry in our country stem from the building and perfecting of institutions, always considering S&T development and innovation as decisive factors to improve competitiveness; quickly absorb the world's advanced scientific and technological advances, both in terms of breeds and equipment; considered science and technology to be the driving force for development, an important production force to create breakthroughs for competitive high-quality and high-value products in the market. In the livestock development strategy for the period 2021-2030, with a vision to 2045. The livestock industry develops towards industrialization and modernization, and at the same time promotes organic and traditional livestock production towards commodity production. High quality, safe chemicals.

However, the competitiveness of the livestock industry in our country is at risk of losing its advantage due to facing challenges and difficulties such as climate change, complicated disease developments, environmental pollution, sanitation and hygiene. food safety, competition pressure is increasing when implementing commitments to free trade agreements and the industrial revolution 4.0. In order to promote the rapid and sustainable development of the Livestock industry, the promotion of scientific and technological research is an urgent requirement today, there should be breakthroughs in scientific research to select and create strains and breeds of animals. raising productivity and quality, industrial production, synchronously with large scale and high uniformity, strengthening the management and production of breeds; Applying high technology, advanced technology, new technology, biotechnology and quickly absorbing new technical advances for seed production, feed, environmental treatment and livestock development.

Keywords: *Situation, orientation, scientific research, animal husbandry*

CURRENT STATUS AND DEVELOPMENT ORIENTATION OF LIVESTOCK PRODUCTION IN MEKONG DELTA (MD) OF VIETNAM

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Mekong delta of Vietnam is a fertile soil region, available fresh water and temperate climate, which is favorable for agricultural development and has a large contribution to food sources for domestic consumptions and exports. Animal husbandry is popularly considered as an important-agricultural production in the World, which makes many useful products such as meat, milk, eggs, organic fertilizer, pets, tourism, etc. It contributes to better income, improving human nutrition and intelligence and production diversifications based on certain production models for both the rich and poor producers. However the development of animal production in MD is still limited due to some objective and subjective reasons. In this paper the author will present the current production status, explain the reasons for applying advanced technologies and development principles of sustainable production in global trends of adaptation to climate change, new technologies, financial conditions, human resources and technically applying levels. While there are advantages in production for industrial farms, the traditional ones with their limited resources must need more support on development policies and material investments from the government to make more quality and safe animal products for local consumption and export with better benefits on economic development, environment and society.

Keywords: *Animals, development, high technology, production potentials, poultry.*

WIDELY CONSIDERED AND SURVIVED THAT HAS BEEN EFFETED BY INSULIN LIKE GROWTH FACTORS (IGF – 1) WITH ANIMALS

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Insulin like growth factor 1 (IGF – 1) therapy suggestion with fetus of animals to enhance safety response for young animal through nutrients transfers of host animal. Health indicators for prenatal period animals in immune availability, repairment of internal organs of body to remain on next productive cycles that is constant to be pathogens with least increase nutrient disorders after neonatal period. Young animal is required by nutritional needs that is balanced especially soon acceptance with feedstuffs sources which is better formation of IGF – 1 available next supply feed additives to improve digestion and absorption of nutrients. Therefore, activated substracts in metabolism regulation of skeletal system of animal are enhanced during life cycle. After those events, all of animal species are being efficiently discarded to assistance factors with immune barriers function of endocrine system.

Keywords: *IGF – 1, immune response, digestion, absorption, neonatal period.*

APPEARANCE CHARATERISTICS AND GROWTH PERFROMCNE OF CROSSBREDS (WAGYU × LAI ZEBU) IN THAI BINH PROVINCE

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The objective of this investigation was to evaluate the appearance characteristics, growth performance traits of WGLZ crossbred calves in Thai Binh province from January 2020 to June, 2022. A total of 67 WGLZ crossbred calves were numbered and monitored. Routine and conventional methods were applied for this research. Descriptive statistics and Proc GLM in MINITAB16 were used to analyze the data. The results showed that the appearance of the WGLZ crossbred calves is relatively uniform, the coat color of black-gray and red-brown accounted for the most proportion with 87.88%; black-yellow colour accounted for 3.03%; the proportionof

white-spotted calves accounted for 9.09%. WGLZ crossbred calves have higher body weight and growth rate than Zebu crossbred calves; average birth weight was 24.46 kg/calf; at 12 months old reached up to 237.1 kg and at 18 months old reached up to 306.2 kg/calf. Their body weights were 10.26 to 30.45% higher than those of BrLS calves; higher than LS calves from 34.26 to 55.03% in the periods from birth to 18 months old. The body weight of WGLBr crossbred calves group was higher than of WGLS. The ADGs of the WGLZ group by the age classes reached from 448.10g/calf/day to 750.90 g/calf/day; 33.93% higher than the BrLS group; 30.17 to 60.09% higher than the LS group. In which, the ADGs of WGLBr group achieved from 320.40 g/calf/day to 769.60 g/calf/day.

Keywords: *Wagyu × Lai Zebu, crossbred beef cattle, growth performance*

ESTOGENIC EFFICACY ASSESSMENT AND RESULTS OF BREEDING USE OF WAGYU BEEF SEMEN ON CROSSBRED HF CATTLE AT BA VI

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The aim of this study to assess the estrus rate, pregnancy rate and breeding coefficient of HF crossbred cows when artificially inseminated with Wagyu bull sperm raised in the area of Ba Vi Cow and Grassland Research Center. The experiment was conducted on 245 healthy HF crossbred cows, free of infectious and reproductive diseases, with normal fertility, no defects in appearance as well as in the reproductive organs; rear or breeding cows, aged from 3-6 years, weight ≥ 300 kg for post-productive cows and ≥ 400 kg for breeding cows. During the experiment, the estrus rate, pregnancy rate and mating coefficient were monitored. The results were obtained, the estrus response rate of the Holstein Friesian cattle group (89.79%), the rate of pregnant cows through 2 mating times reached 74.55% and had a mating coefficient of pregnancy of Holstein Friesian cattle of 2.12 doses/pregnancy through 2 mating.

Keywords: *Holstein, estrus rate, pregnancy rate, mating coefficient*

USE OF NON-LINEAR REGRESSION FUNCTION TO DESCRIBE THE PROFILE OF CHANGES IN YIELD AND QUALITY OVER THE REGROWTH AGE TO DETERMINE THE APPROPRIATE HARVESTING TIME FOR MOMBASA GRASS (*Panicum maximum* cv. Mombasa) IN NGHIA DAN, NGHE AN

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The study was conducted to determine the appropriate harvesting time of Mombasa grass in 3 different seasons in Nghia Dan, Nghe An. Secondary data were collected from 2016 to early 2021. Three growth functions, viz. Gompertz, Logistic, and Johnson-Schumacher were used to describe the change in dry matter yield (DMY) and nutrient composition of Mombasa grass over 12 regrowth ages in 3 seasons, viz. rainy, dry, and hot. The most suitable function was determined based on the accuracy and reliability of the calculated functions. The optimal cutting interval for each season was determined based on the results of analysis of variance and regression analysis of DMY and nutrient composition of grass over regrowth age. The results showed that, Logistic function was the most suitable to describe profile of accumulated DMY over regrowth age. The optimal Mombasa cutting interval in the Dry, Hot and Rainy seasons was 45, 35 and 30 days, respectively.

Keywords: *Non-linear regression function, Mombasa grass, harvesting time, yield, quality*

RESEARCH ON BIOLOGICAL CHARACTERISTICS AND CLASSIFY OF MELIPONINI IN 6 PROVINCES IN THE NORTHERM MIDLAND AND MOUNTAINOUS REGION OF VIET NAM

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Researched on biological characteristics, collected worker bee samples to classify the meliponini for conservation, researched on exploitation, developed genetic resources of meliponini and prevented the risk of degradation and lead to loss gen source. The surveillance was in 6 provinces in the Northern midland and mountainous region (Hoa Binh, Dien Bien, Son La, Lai Chau, Bac Kan, Bac Giang), interviewed 540 people, 535 people of which have kept and keeping meliponini. Meliponini were distributed widely in terms of habitats and altitudes, such as in old forests, in tree hollows, housewall hollows, walls, rock hollows and some lived in termite nests. In some areas in Lai Chau, Dien Bien they lived in the columns of houses, or on the ground of households, distributed from an altitude of 29m to 1736m above sea level. Honey of meliponini was not high, from 306g to 463g/herd/year. With a total of 566 nests that have been caught from the wild, the current number of nests is 129, and 22 of which have been raised for 2 years or more, account for 3.88%, the remaining 544 colonies were raised for less than one year. There were herds when brought back to raise for 2 months, they were leaved away. 3 breeds have been identified (Lepidotrigona, Lisotrigona, Tetragonula) with 08 subspecies (Lepidotrigona flavibasis, Lepidotrigona sp1, Lisotrigona carpenter, Tetragonula sp 2, Tetragonula collina, Tetragonula sp 3, Tetragonula sp 4, Tetragonula sp 5), especially discovered 01 breed was consider to be a new breed published in the prestigious international journal Zookey 1089; 53-72 (2022).

Keywords: *Meliponini, surey, distribution, Apidae: meliponini.*

ANALYZING THE VALUE CHAIN OF PORK INDUSTRY IN CHAU THANH DISTRICT, TRA VINH PROVINCE

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Investigating agents in the pork value chain in Chau Thanh district, Tra Vinh province to assess the status of pork production, processing and consumption in the locality using the value chain approach. The findings showed that the process of product consumption from the producers (livestock breeders) to the final consumers is quite closely connected. This connection forms a product distribution network in which all participating factors play an important, positive role in delivering the product to consumers. However, to reach the consumers, pork products must go through many intermediate stages, in which pig farmers suffer losses because traders dominate the buying and selling prices, negatively affecting the producers' profits and competition in the market. Therefore, to solve this problem, we need to build a stable input and output market.

Keywords: *value chain, production, consumption, connection, actors.*

SMART AGRI-SYSTEMS FOR THE PIG INDUSTRY

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Vo Van Su (collection)

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The projected rise in the global human population and the anticipated increase in demand for meat and animal products, albeit with a greatly reduced environmental footprint, offers a difficult set of challenges to the livestock sector. Primarily, how do we produce more, but in a way that is healthier for the animals, public, and the environment? Implementing a smart agri-systems approach, utilising multiplatform precision technologies, internet of things, data analytics, machine learning, digital twinning and other emerging technologies can support a more informed decision-making and forecasting position that will allow us to move towards greater sustainability in future. If we look to precision agronomy, there are a wide range of technologies available and

examples of how digitalisation and integration of platform outputs can lead to advances in understanding the agricultural system and forecasting upcoming events and performance that have hitherto been impossible to achieve. There is much for the livestock sector and animal scientists to learn from the developments of precision technologies and smart agri-system approaches in the arable and horticultural contexts. However, there are several barriers the livestock sector must overcome: (i) the development and implementation of precision livestock farming technologies that can be easily integrated and analysed without the support of a dedicated data analyst in house; (ii) the lack of extensive validation of many developed and available precision livestock farming technologies means that reliability and accuracy are likely to be compromised when applied in commercial practice; (iii) the best smart agri-systems approaches are reliant on large quantities of data from across a wide variety of conditions, but at present the complications of data sharing, commercial sensitivities, data ownership, and permissions make it challenging to obtain or knit together data from different parts of the system into a comprehensive picture; and (iv) the high level of investment needed to develop and scale these technologies is substantial and represents significant risk for companies when a technology is emerging. Using a case study of the National Pig Centre (a flagship pig research facility in the UK) we discuss how a smart agri-systems approach can be applied in practice to investigate alternative future systems for production, and enable monitoring of these systems as a commercial demonstrator site for future pork production.

Keywords: *Digital farming, Pork, Precision Livestock Farming, Production, Systems approach*

PRACTICAL ASPECTS OF TWIN PREGNANCY DIAGNOSIS IN CATTLE

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Twin pregnancies are an economically unwanted phenomenon in dairy cattle, not only because they increase pregnancy losses, but also because antibiotics usage and culling rate of the dam are also dramatically increased due to them, furthermore animal welfare issues are also affected through them. In cattle, under field conditions using an early pregnancy determination tool, the first accurate diagnosis from the pregnancy status is available from around day 28, although further confirmations of pregnancy are required. Twin pregnancy diagnosis is available either by rectal palpation or ultrasonography. The measurement of pregnancy specific proteins are also available to determine gestation, but there is still a long way to go to properly identify twin pregnancies. In this commentary, we compared our own results with the literature data in this field with a special emphasis on the clinical practices.

Keywords: *cattle, PAG, pregnancy loss, PSP-B, rectal palpation, twin, ultrasound*

HEAT STRESS IN POULTRY

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Heat stress is a common reality in poultry production, its effects are quite complex and harmful and depend on the intensity and duration of the exposure to high temperatures.

The gut is affected by heat stress through several pathways, including organ ischemia and hypoxia, as well as oxidative stress.

In heat stress challenges, the intestinal barrier is compromised because of lower tight junction protein expression, enterocyte damage, and microbiome unbalance, leading to gut health issues such as dysbiosis and necrotic enteritis.

At the gut level, phytochemicals such as carvacrol, cinnamaldehyde, capsaicin, silymarin, cineol, and menthol, among others, have been found to alleviate heat stress through their antioxidant capacities, leading to improved animal health and performance.

Keywords: *heat stress, avian, oxidative, intestinal*

BIOLOGICAL TREATMENT OF CROP RESIDUES AS AN OPTION FOR

FEEDIMPROVEMENT IN TROPICS

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In tropical countries, roughages feeds are the major diets of ruminant animals which are poor in quality. Hence, improving the nutritive value of feeds of such kind is vital for best utilization for ultimate goal of increased animal production. Animal feeds and feeding practices can be changed by biological catalysts such as fungi with the objective to improve nutritive value and to reduce environmental waste. Biological treatment of such crop residues using white rot fungi can break the ligno- cellulose structure, liberating free cellulose and thus enhancing their feeding value. Biologically treated roughages have higher digestibility for most of the nutrients with an increase in crude protein content as compared to untreated material, besides ensuring more fermentable substrates in the rumen. In addition, treatment of low-quality animal feeds with white rot fungi species increases the protein and ash contents with a reduction of its fibrous fraction. Moreover, biological treatment roughages feed increases the feed intake, digestibility and eventually livestock production and reproduction. However, the application of biological treatment of roughages is limited by lack of biological agents such as the typical fungi or its products (enzymes) and knowledge of utilization of such agents. The other setback is reduction of weight of the final substrate after the treatment in which case a dry matter loss of substrate can be as high as 40% in prolonged incubation with the fungus. Moreover, there is lack of know how to use such technology in most of tropical Africa including Ethiopia. This review was then organized to create awareness on utilization of biological treatment as remedy for poor quality of roughages, optimizing mechanisms must be sought.

Keywords: *biological treatment, Ethiopia, white rot fungi*

GRASSLAND-BASED LIVESTOCK FARMING AND BIODIVERSITY

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Grasslands dominate land cover nationally and globally, and their composition, structure and habitat value are strongly influenced by the actions of domestic and wild grazing animals that feed on them. Different pastures are characterised by varying opportunities for selective feeding by livestock; agronomically improved, sown swards generally consist of a limited range of plant species whereas longer-term leys and semi-natural grasslands are characterised by a more diverse mixture of plants. In the case of botanically diverse permanent pastures/grazing lands, the dietary preferences of different grazers have a more pronounced effect on the botanical composition of the sward in the longer term. Selection of a dominant species within the sward can give less abundant components a chance to compete, increasing community evenness and species richness. Conversely, the selection of minor components reduces sward compositional heterogeneity and hence plant species richness and evenness. Body size, gut type (foregut vs hindgut fermentation), physiological status (growing, pregnant, lactating), metabolic status (extent of body reserves) and environmental conditions all influence the nutrient requirements of a given animal and related foraging priorities. The diet selected is also strongly influenced by the availability of preferred food items, and their vertical and horizontal distribution within the sward. In general, larger animals, such as cattle and horses, are less selective grazers than smaller animals, such as sheep and goats. They are quicker to switch to consuming less-preferred sward components as the availability of preferred resources declines due to their greater forage demands, and as a result can be very effective in controlling competitive plant species consistently avoided by more selective grazers. As a result, low-intensity mixed grazing of cattle and sheep has been shown to improve the diversity and abundance of a range of taxa within grazed ecosystems. Mixed/co-species grazing with different animals exploiting different grassland resources is also associated with increased pasture use efficiency in terms of the use of different sward components and related improvements in nutritional value. In situations where cattle are not available, for example if they are not considered commercially viable, alternative species such as goats, ponies or South American camelids may offer an opportunity to diversify income streams and maintain productive and biodiverse pastures/grazing lands. Stocking rate and timing of grazing also have a considerable role in determining the impact of grazing. Regardless of the species grazing or the pasture grazed, grazing systems are dynamic since selective grazing impacts the future availability of sward components and subsequently dietary choices. New technologies under

development provide opportunities to monitor plant/animal interactions more closely and in real time, which will in future support active management to deliver targeted biodiversity gains from specific sites.

Keywords: *Diet selection, Grassland, Grazing pressure, Habitat, Sward composition*

A RESPONSE OF GROWTH PERFORMANCE, NUTRIENT DIGESTIBILITY AND NITROGEN RETENTION OF GROWING FEMALE RABBITS TO LEVELS OF *Psophocarpus scandens* VINES IN DIETS

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A study was implemented to determine the optimum levels of *Psophocarpus scandens* (PS) vine in diets of female rabbits (New Zealand x local breed) based on growth performance, nutrient intake and digestibility. It was a complete randomized design with five treatments and three replicates. Sixty female rabbits at 60 days of age (799 g on average) were allocated in the experiment for 70 days. The treatments were levels of 0, 15, 30, 45 and 60% (DM basis) of *Psophocarpus scandens* replacing Para grass (PG) in the diets. They were corresponding to the treatments named PS0, PS15, PS30, PS45 and PS60, respectively. PS protein content was higher than that of PG (23.1 vs. 9.9% of DM) and NDF content was lower (41.8 vs. 61.6% of DM). The results showed that dry matter intake was significantly reduced for the highest PS proportions ($P < 0.01$) with 93.5 - 93.0 - 92.7 - 85.0 and 84.5 g/d for the PS0 to PS60 diets respectively. Crude protein intake of rabbits significantly ($P < 0.01$) increased with the increase of the PS proportion. The daily weight gain of the rabbits was higher in the diets with PS replacement (15.1, 17.3, 18.2, 16.3 and 17.5 g/d for diets PS0 to PS60 respectively). However, only the daily weight gain of the PS30 treatment was significantly higher than that of the PS0 one. The nutrient digestibility (dry matter and crude protein) and nitrogen retention of rabbits were also significantly ($P < 0.01$) improved with increasing the level of PS in the diets. It was concluded that the use of *Psophocarpus scandens* vine to replace Para grass improved nutrient utilization, daily weight gain and profits, and replacing Para grass by *Psophocarpus scandens* at a level of 30% (DM) could be recommended for producers' application.

Keywords: *Para grass, Psophocarpus scandens, growing rabbit, feed utilization, daily weight gain, digestion.*

EFFECT OF BANANA STEMS (*Musa sapientum* L) FERMENTED WITH MOLASSES, BIOCHAR AND WITH OR WITHOUT VINASSE ON WEIGHT GROWTH OF MUSCOVY DUCK (*Cairina moschata*)

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The experiment was carried out on 72 healthy muscovy ducks starting at 28 days old to assess the effect of banana stems (*Musa sapientum* L) fermented with molasses, biochar and with or without vinasse on weight growth of muscovy duck (*Cairina moschata*). Four treatments and three replications made up a completely randomized design (CRD) of the experiment. Each batch is an experimental unit, each experimental unit consists of 6 muscovy ducks.

Four treatments correspond to 4 different diets: Treatment 1: 30% mixed banana with molasses + 70% mixed feed; Treatment 2: 30% mixed banana with molasses and 1% Biochar + 70% mixed feed; Treatment 3: 30% mixed bananas fermented with molasses + 55% mixed feed + 15% vinasse; Treatment 4: 30% mixed banana with molasses and 1% Biochar + 55% mixed feed + 15% vinasse.

Experimental results: Treatment 4 had the lowest feed conversion ratio (5.87), followed by Treatment 3 (6.85), Treatment 1 (6.99), and the highest belonged to Treatment 2 (7.12). However, these variations were not statistically significant ($P > 0.05$). In 4 experimental treatments, Treatment 3: 30% mixed banana fermented with molasses + 55% mixed feed + 15% vinasse was more effective than other treatments in terms of weight gain and feed consumption.

It was concluded that vinasse and banana stems can be used for silage with molasses as a good feeding source for muscovy ducks. The addition of Biochar or the absence of Biochar in the diet did not significantly affect the weight gain of ducks at the end of the experiment.

Keywords: *Muscovy duck, fermented banana, vinasse, biochar*

DETERMINATION OF OPTIMAL RATIO FOR TOTAL DIGESTIBLE SULFUR-CONTAINING AMINO ACIDS TO LYSINE IN ROSS 308 BROILERS FROM 1 TO 14 DAYS OF AGE

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The objective of the study was to determine the effect of increasing the ratio of SID TSAA to Lys in broiler chicks diets for 1 to 14 d of age on growth performance, efficiency of Lys utilization, caloric efficiency and carcass characteristics. In this study, 400 day-old straight-run Ross 308 broiler chicks sourced from a commercial hatchery were randomly allotted into 5 treatments following a Randomized Complete Block Design (RCBD). The treatments used were five ratios of standardized ileal digestible (SID) total sulfur-containing amino acids (TSAA) to Lysine (Lys) in diet of 0.62, 0.68, 0.74, 0.80 and 0.86. There were 8 replicates per treatment with 10 birds in each cage. Result showed that increasing SID TSAA to Lys ratio improved (quadratic, $P < 0.05$) day 14 BW, BWG, ADG, and FCR. Broilers fed the diet containing SID TSAA to Lys ratio of 0.80 had greater ($P < 0.01$) BW, BWG, and ADG compared with those fed diets containing SID TSAA to Lys ratio of 0.62 and 0.86. Increasing SID TSAA to Lys ratio in the diets did not affect ($P > 0.05$) livability. No ($P > 0.05$) significant differences were observed in blood urea nitrogen (BUN) concentrations across varying levels of SID TSAA to Lys ratios. Overall (day 1 to 33), BWG and ADG tended (quadratic, $P = 0.06$) to be increased with increasing SID TSAA to Lys ratio in diets fed from day 1 to 14 of age. There were no ($P > 0.05$) differences in FCR, livability across the levels of SID TSAA to Lys ratios. Carcass characteristics at day 34 of age did not ($P > 0.05$) differ among the treatments regardless of the SID TSAA to Lys ratio in the booster diet.

Keywords: *SID TSAA, SID Lys, Broiler, Ross 308, booster diets*

PRELIMINARY RESULTS OF UTILITY FOR WAGYU AND RED ANGUS BULL'S STRAW FROZEN SEMEN ON ZEBU CROSSBRED COWS IN THAIBINH PROVINCE, VIETNAM

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The objectives of this research were to investigate the conception rate, proportion of calving, calving status, gestation length in Zebu crossbred cows artificially inseminated with Wagyu and Red Angus bull's straw frozen semen, in Thai-Binh Province, from June 2019 - March 2021. Total of 236 Zebu crossbred cows were chosen, inseminated, and monitored for conception, pregnant status, calving, and gestation length. The conventional researching methods, data collection in accordance with rural conditions were applied. Minitab software version 16 and SAS(9.4) were utilized for data analyses. Proc Descriptive Statistics was utilized for analyzing the continuous data. The categorical and nominal data were analyzed by Proc Table. Logistics regression with binary was used to evaluate factors affecting the results of artificial inseminations. The results showed that the common conception rate of cows inseminated with Red Angus and Wagyu semen was 51.00%, in which 48.00% and 54.00% for cows inseminated with Red Angus and Wagyu semen, respectively. Successful calving proportion of cows acquired 78.91%, in which 75.76% when they were inseminated with Red Angus semen and 81.48% with Wagyu bull's semen. Parity and cows' breeds were associated with calving difficulty of Zebu crossbred cows when they were inseminated with Red Angus and Wagyu bull's semen ($P < 0.05$). It is concluded that Zebu crossbred cows in this region were eligible to be inseminated with Wagyu and Red Angus bulls' semen to create the highly yielded beef calves in accordance with rural management conditions, adapted with tropical and coastal climate as in Thai-Binh province of Vietnam.

Keywords: *Zebu crossbred, Wagyu cattle, Red Angus cattle, conception rate, calving difficulty and ease.*

TANNINS IN GREEN FORAGE AFFECT THE DIGESTION OF RUMINANTS

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Tannins are a complex group of polyphenolic compounds found in a wide range of plants commonly used as forage greens by ruminants. Tannins are considered to have adverse and beneficial effects depending on their concentration, nature, animal species, physiological state of the animal and the composition of the diet. The negative effect of tannins reduces feed intake, directly by the astringent properties of tannins and indirectly by reducing the digestibility of forage by livestock. Beneficial effects of tannins when forages containing low levels of tannins are ingested, may be due to the protection of proteins from microbial breakdown (VSV) thereby increasing the amount of undigested proteins into the small intestine. In addition, a large amount of microbial biomass enters the small intestine as a result of microbial protein synthesis. Polyphenols or plants containing tannins reduce CH₄, so it can be strategically used in diets to reduce methane (CH₄) emissions from ruminants.

Keywords: *Forage, tannin, ruminant, rumen, digestion.*

Effect of BLCS on growth performance and carcass parameters Luong Phuong broiler

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The purpose of this study was to assess the impact of the use of Bio Livestock Clean System (BLCS) inoculants supplemented with feed and litter fillers on broiler performance. A total of 240 1-day-old Luong Phuong chickens, arranged completely randomly into 4 treatments, with 20 birds/treatment and 3 replications / treatment. Treatment1: Diet basic by Company (control diet), Treatment2: As diet basic plus BLCS 1 kg/Ton Feed), Treatment 3: as diet basic plus BLCS (1 kg per 30 m² floor), Treatment4: As diet basic plus BLCS kg/Ton Feed and BLCS (1 kg per 30 m² cage floor). The result that the use of BLCS in addition to feed and BLCS on cage floor has affected the feed intake rate of experimental chickens, chickens tend to receive more feed. The weight of the experiment ended was improved from 5.37% -7.17% when adding BLCS in to feed/or on cage floor compared to no supplementation. Using of the BLCS plus diet and the plus BLCS with 1 kg per 30 m² cage floor improved the daily weight gain from 5.43 to 7.16% compared to not using BLCS. Using BLCS in the diet and BLCS on cage floor can achieve daily weight gain higher than that control diets. Using BLCS in broiler feed was 1kg/ton and cage floor 1kg/30 m²

Keywords: *Broiler, Probiotic, Bio Livestock Clean System, feed, digestibility*

DETERMINE WHICH FOOD TYPE IS APPROPRIATE FOR RED-EARED CHICKENS

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The study on over 300 Red-eared chickens raised for meat was conducted on the grounds of evaluating the effect of two typical types of food namely food that is blended from local raw materials (group 1) and industrial mixed food (group 2) on reproductiveness, nutrients digestion and the quality of meat the chickens gave out. The experiments were carried out by randomly dividing a factor. The result has given a conclusion that different types of food have different impacts on the chickens' reproductiveness and their quality. Mixed food has proven to be more effective in both reproduction and Red-eared chickens' quality. At 20 weeks old, the number of Red-eared chickens at group 2 weighed 893.25g per chicken, much heavier than group 1 those using local raw materials. Group 2 had a higher growth rate than group 1 with values of 6.23 and 6.16 g/head/day, respectively. Feed efficiency of group 2 was better than group 1 with 6.28 and 6.33 kg feed/kg weight gain. The total input cost of the batch at group 1 is lower than group 2, therefore the livestock farming efficiency of group1 is better than

group2 with an income higher than 6.470,1 dong. Nutritional value in breast meat and thigh meat of the two experimental groups is different. The group 2 had a higher nutritional content in the breast meat than the group 1. However, this value was higher in the thigh meat of the group 1 than group 2. In that case, depending on economic conditions, the scale of farming and the market, farmers should consider using industrial mixed feed or blended feed for commercial Red-eared chicken farming.

Keywords: *Red-eared chicken, weight gain, growth ability, meat quality.*

RESEARCH ON SOME TECHNICAL METHODS TO COMPLETE THE FEED PRODUCTION PROCESS FOR WESTERN HONEY BEE (*APIS MELLIFERA*)

Vol 140. August, 2023. Pp. 32-43

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The beekeepers must use supplementary feed to replace natural pollen in the period lack of pollen in ensuring efficiency and quality of honeybee. However, the current powder feeds for bees have many disadvantages such as the powder size is not suitable for bee' digestion. It will lead to wasting, polluting inside beehive environment. In addition, the short self-life because of the high risk of yeast, mold infections in processing and storing make trouble for users. This study's aimed at completing the process of manufacturing feed for Western honey bees (*Apis mellifera*) to replace pollen: determining the size of power feed that accords with bee's capacity; choosing mode of killing bacteria by ultraviolet in mix processing to reduce mold, extend life by which increase productivity and quality of honeybee, bring in cost- efficient for beekeepers.

The results showed that: the size of power feed that accords with feed's bee is 0.4 mm. With this power size, the bees used about 111.1 grams feed per day, capacity of honey achieved 6.57kg/colony, the quality of honey met the national standard TCVN 12605:20019. The method of killing bacteria in mix bin with 4 UV lamps (capacity of 60W/lamp) reduced the yeast, mold from 1×10^5 cfu/g (in original feed) to 1.2×10^2 cfu/g; Total Aerobic Microbial Count went down to $1.8 \times 10^3 - 9.1 \times 10^2$ cfu/g from 1.8×10^5 cfu/g.

Keywords: *supplementary feed to replace natural pollen, feed for bees, process of manufacturing feed for Apis mellifera.*

EFFECTS OF SUPPLEMENTATION TRA FISH (*PANGASIANODON HYPOPHthalmus*) OIL TO ELEPHANT GRASS AND CONCENTRATE AS SUBSTRATES ON *IN VITRO* GREENHOUSE GAS EMISSIONS AND ORGANIC MATTER DIGESTIBILITY

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Experiment was conducted to evaluate *in vitro* CO₂ and CH₄ production effected by Tra fish oil (TFO) levels. The experimental design was a completely randomized design with 5 treatments and 3 replications. The five treatments were supplementation of five levels of TFO 0; 1.5; 3; 4.5 and 6.0% corresponding to TFO0; TFO1.5, TFO3, TFO4.5 and TFO6, respectively, to Elephant grass mixed with 20% of concentrate (DM basis). Rumen fluid of cattle fed Elephant grass mixed with 20% of concentrate was used as inoculum. Gas production was measured at 0; 3; 6; 9; 12; 24; 48; 72 hours. The concentrations of CH₄ and CO₂ were analyzed at 24, 48 and 72 hours. The results showed that the *in vitro* total gas, CH₄ and CO₂ production from 0-72 h were significantly different (P<0.05) among the treatments and they were gradually abated when increasing CFO levels from 0 to 6%. CH₄ production (ml/g OM) at 72h decreased from 37.6-23.4 and was inversely proportional to levels when TFO was added (0-6%). However, the *in vitro* DMD and OMD values were also reduced (P<0.05) from the

TFO0 to the TFO6 treatment. It was concluded that supplementation Tra fish oil from 0 to 6.0% to the Elephant grass with 20% concentrate gradually reduced greenhouse gases production, however the DM and OM digestibility was also decreased. The optimal level of Tra fish oil supplementation in the diet includes Elephant grass and 20% concentration was 3% (DM basis).

Keywords: *fish oil, grass, concentrate, green house gases, in vitro*

EVALUATING THE EFFECTIVENESS OF USING BIOLOGICAL BEDDING IN BEEF CATTLE PRODUCTION

Vol 140. August, 2023. Pp. 55-66

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The aim of this study is to evaluate the effectiveness of the use of biological mattresses in raising beef cattle for growth, development, gas concentration in the barn, and economic efficiency. The experiment was conducted on 26 pure Senepol cattle imported from Australia divided into 2 batches (Experiment): the experiment and control for each batch were 21 cows aged 14 – 18 months old and had an average weight of 385.31 ± 3.05 kg. The cows in the control batch were raised on a cement base and cleaned daily, the cows in the experimental batch were raised on a biological pad imported from T&T 159 Joint Stock Company with a shelf life of 60 days. During the experiment, the herd was determined the indicators of weight gain at the beginning and end of the experiment and measured NH₃, H₂S daily in the laboratory every 24 hours with the GX-6000 device at the location between the barn and the economic efficiency determined by the difference between the expenditure and the profit earned. Experimental results show that the use of biological padding in beef cattle breeding has reduced the concentration of H₂S and NH₃ gases in the barn to improve the environment in the barn to help the herd grow evenly, healthy, and maintain growth. In addition, it helps to save care work, clean cages and bring high economic efficiency.

Keywords: *biological padding, beef cattle, gas concentration in the barn, economic efficiency*

RESULTS OF ASSESSMENT OF YIELD AND QUALITY OF CRUDE BIRD'S NEST IN BINH DUONG AND BINH PHUOC PROVINCE

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The objective of this study was to evaluate the yield and quality of bird's nests in swiftlet houses in Binh Duong and Binh Phuoc provinces. Eighty swiftlet houses for a province were selected from the 200 surveyed swiftlet houses for a province to evaluate the yield, the percentage of bird's nests, and the nutritional composition of bird's nests. The swiftlet house has an average area of 270.97-275.73 m² (2-3 floors), and the age of harvest is about 5.24-5.35 years. Temperature, humidity, sound intensity, and light intensity in the swiftlet houses, respectively 27.78 - 27.93°C; 80.75-80.85%; 71.04-71.06 dB and 0.18-0.20 Lux and a number of other factors in the bird's nest are similar. The results show that the yield of bird's nest for a harvest in Binh Duong is 14.19 g/m²; in Binh Phuoc is 12.01 g/m². The percentage of type I and type II bird's nests in Binh Duong is 30.62% and 46.36% respectively; in Binh Phuoc is 30.41% and 49.16%. The percentage of dry matter, protein, carbohydrates, and total fat of bird's nests in Binh Duong is 84.65%, 57.56%; 22.81%; 0.56% respectively; in Binh Phuoc is 84.53%; 57.68%; 22.59%; 0.53%. In the crude protein composition of bird's nest in two provinces, there are 18 kinds of amino acids. The yield and quality of bird's nests in Binh Duong and Binh Phuoc are equivalent.

Keywords: *Bird's nest, Productivity, Quality, Nutritional Composition, Amino acids*

SITUATION ON ANTIBIOTIC USE IN CHICKEN FARMS IN TRA VINH PROVINCE

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This study aimed to assess the current status of antibiotic usage in chicken production on 135 backyard chicken farms in Tra Vinh province. The results showed that the use of antibiotics is relatively common in raising backyard chickens; there are 16 commercial antibiotics, of which Amox-Colis is commonly used (62.22%). This survey revealed that antibiotics were used up to 86.67% for disease prevention and 100% for disease treatment. There are some households using antibiotics to enhance lean meat in chicken production (15.56%). Only 69.63% of households used the dose recommended by the manufacturer; the remaining households used the dose incorrectly. Some households arbitrarily used antibiotics (32.59%) without following a withdrawal period stated on the label to sell chickens (91.11%), and up to 91.85% of households did not send samples for antibiotic susceptibility testing. The uncontrolled use of antibiotics in household chicken production can increase the risk of antibiotic resistance in bacteria, causing economic losses to farmers and affecting public health.

Keywords: *antibiotic, antibiotic dose, chicken, Tra Vinh province*

LIVESTOCK SITUATION, VETERINARY HYGIENE, AND EPIDEMIOLOGICAL CHARACTERISTICS OF LUMPY SKIN DISEASE IN CATTLE IN BEN TRE PROVINCE

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The current study was conducted to evaluate the livestock situation, veterinary hygiene, and investigated the epidemiological characteristics of Lumpy skin disease (LSD) among cattle in Ben Tre province. A survey was conducted from January to March 2023 on 180 households with a total of 1,131 cattle. Primary and secondary data were collected via cross-sectional and retrospective methods. The results showed that the total number of cattle in Ben Tre province increased steadily from 2019-2021 and decreased by 5.22% in 2022. The morbidity rate of LSD in 2021 and 2022 was 28.42% and 22.45%, respectively. The survey results revealed that the average herd size in Ben Tre province was 6.28±4.82 heads/household. Common feed sources for cattle were hay, grass, and a combination of grass and rice bran, broken rice, or mixed feed. The percentage of households with durable cattle shed was 75.56%, with insect nets (75.0%), daily cleaning the cattle shed (80.0%), with fences around the cattle shed (28.89%), disinfecting the cattle shed 1 time/month (44.44%), killing ticks by veterinary drugs (34.44%), deworming (48.33%) and LSD vaccination was 68.33%. The morbidity rate of LSD based on clinical manifestations was 11.14%, in which calves ≤ 6 months old were the highest rate. Cattle infected with LSD were associated with age, method of killing ticks, disinfection of cattle shed (1 time/month), and LSD vaccination.

Keywords: *Ben Tre, Lumpy skin disease, cattle, epidemiology, livestock situation, veterinary hygiene*

OVERALL NOTE IN AFFECT OF GASTROINTESTINAL TRACT (GIT) WITH WEANING PIGLETS FROM NUTRITIONAL DIETS

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Information of this overview show that rate of immune in small intestine relates to bacterial activity growth in large intestine which cause poteintial pathogens are dangerous for nursility piglets. Highly antibacterial concentration with gastrointestinal tract under biological infect of cells when using enzyme complexes in piglet

dietary to stimulate digestibility and rate of absorption from nutrients. Nextly, measurement in practice supply to be stable in feedstuffs to make costs decrease more than before time those are decided by several factors as age of animal, condition of diets and feeding targets. Finally, recommence of feedstuff sources should be estimated about quantity and quality for piglets dietary associate with nutritional supplying to limit with quality of undigestive nutrients.

Keywords: *muscosa immune, Bifidobacteria, Microfold cell, enzyme complex, Non-Amylaceous Polysaccharides.*

TECHNOLOGY-BASED GRAZING MANAGEMENT TO UTILIZE THE POTENTIAL OF GRASSLANDS IN A SUSTAINABLE WAY

Vol 141. October, 2023. Pp. 10-25

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Grassland degradation has been observed worldwide and is often the result of overexploitation or abandonment. Precise and knowledge-based grazing management is required to utilize the potential of grasslands in a sustainable manner. Information gaps lead to inefficiencies in rangeland management and ecosystem service provision. Rapid advances in automated sensors and information technology to collect information on grass availability, control animal grazing behavior, and establish data-driven decision support tools Is there any possibility of improving grazing management? Information technology-based sensors and methods enable the acquisition of spatio-temporal dynamics of turf volume and quality as well as turf structure and vegetation composition automatically. These monitoring methods allow precise spatial and temporal adjustment of forage intake and stocking density. Virtual Fence (VF) is an advanced digital tool for fine-tuning the spatial and temporal control of grazing animals. VF allows farmers to dynamically and flexibly adjust grazing by moving virtual contours on the mobile user interface and sending new coordinates to the GPS receiver on each animal's VF collar. VF promises to be highly effective with no apparent negative impact on animal welfare. The potential of VF is huge, but the ability to widely apply it in practice requires the participation of managers, the support of livestock farmers and the calculation of economic efficiency. A decision support system that optimizes grazing management as well as agronomic and ecological outcomes by integrating and analyzing multiple data at high spatial and temporal resolution can provide sufficient knowledge and confidence in grazing management decisions. Integrating key technologies into an overall concept can take grazing management to the next level.

Keywords: *Technology, pasture, management, grazing, use, sustainability*

EVALUATING THE PRODUCTION ABILITY AND HYBRID SUPERIORITY OF VSTP12 COMMERCIAL DUCKS

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The study was carried out at the Cam Binh Poultry Breeding Station from July to August 2023 to evaluate the growth performance and heterosis of commercial ducks VSTP12. The experiment used completely randomised design (CRD) to compare VSTP12 commercial ducks with VSTP1 and VSTP2 ducks. The results showed that at the end of 7 weeks of age, VSTP12 ducks had a survival rate of 97.33%, body weight of 3690.07g with heterosis of 4.15%. Feed consumption for per kg body weight gain was 2.47kg with heterosis of -3.14%. Carcass percentage was 73.69%, breast meat percentage was 22.68%, thigh meat and belly fat percentage were 0.92% 13.81%, respectively. Profit from 100 ducks raised was 3,510,430 VND.

Keywords: *growth performance, commercial ducks, heterosis*

GROWTH PERFORMANCE OF THE CROSSBREDS BETWEEN RED ANGUS AND CHAROLAIS BULLS WITH BRAHMAN CROSSBRED COWS RAISED AT MONCADA STATION

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Research aimed at evaluating the growth performance of calves cows born from two crossbreeding formulas between Red Angus and Charolais bulls with Brahman crossbred cows from birth to 21 months old at Moncada Station. The results of the study on 40 crossbred calves, including 20 Red Angus × crossbred Brahman crossbreds (10 males and 10 females) and 20 Charolais × crossbred Brahman crossbreds (10 males and 10 females) showed weight gain from 3 months to 21 months of age, the weight of cows were born from Charolais × Brahman crossbred was always higher than that of cow were born from Red Angus × Brahman crossbred (the weight at 21 months of age (males and females) was 465.8 and 422.5kg; 439.6 and 397.6kg respectively) ($P < 0.05$). The Brody, Von Bertalanffy, Gompertz growth functions were found suitable to describe the growth pattern in both formulas including Red Angus × Brahman crossbred and Charolais × Brahman crossbred, but in which Brody function is the most suitable with highest R^2 , lowest ME, MSE, MPE and MAPE. The absolute average daily gain from 0-6, 7-12, 13-18, 19-21 months of age of bulls, females were born from Red Angus × Brahman crossbred was lower than that of bulls, females were born from the formula is Charolais × Brahman crossbred (males and females) was 804.44; 620.02; 677.20; 611.11 and 759.40; 550.00; 597.22; 547.80 g/day; 767.22; 579.41; 632.22; 579.89 and 732.90; 525.60; 555.60; 498.91 g/day respectively. Through the study, it can be concluded that the two formulations including Red Angus × Brahman crossbred and Charolais × Brahman crossbred have good growth potential under breeding conditions at the North of our country.

Keywords: *Red Angus crossbred, Charolais crossbred, non-linear function models, absolute average daily gain.*

EFFECT OF *SACCHAROMYCES CEREVISIAE* LEVELS AND INCUBATION TIME ON QUALITY OF FERMENTED BROKEN RICE

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This study was carried out to determine the optimal *Saccharomyces cerevisiae* level and incubation time on the quality of fermented broken rice for nutrients supplementation on livestock. The experiment was arranged in a completely randomized design with 5 treatments and 3 replicates and the incubation time of 108 hours. The treatments were the levels of *Saccharomyces cerevisiae* being 0; 2.5; 5; 7.5 và 10% corresponding to RY0; RY2,5; RY5; RY7,5 and RY10 treatment, respectively. The results showed that the *Saccharomyces cerevisiae* density and crude protein (CP) gradually increased from 0 to 48 hours and then gradually decreased. In general, the dry matter (DM), organic matter (OM), ether extraction (EE) and crude fiber (CF) contents of fermented broken rice were gradually reduced by the the incubation time and there was no difference among the treatments ($P > 0.05$). The density of *Saccharomyces cerevisiae* and CP content were the highest for the RY5 treatment at 48h incubation (200×10^6 CFU/g and 9.17%DM, respectively). The conclusion was that at the level of 5% rice and 48 h incubation was optimum in the fermented broken rice for supplementing the livestock diets in the coming experiments.

Keywords: *nutrients, density, fermentation, broken rice, probiotics, incubation time.*

EFFECTS OF SUPPLEMENTATION CONCENTRATE IN THE DIET ON *IN VITRO* CH₄, CO₂ GAS EMISSIONS AND ORGANIC MATTER DIGESTIBILITY

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Experiment was conducted to evaluate *in vitro* CH₄ and CO₂ production effected by concentrate (C) levels. The experimental design was a completely randomized design with 5 treatments and 3 replications. The five treatments were supplementation of five levels of concentrate 0, 10, 20, 30 and 40% corresponding to C0, C10, C20, C30 and C40, respectively to Elephant grass as the substrates (DM basis). Rumen fluid of cattle fed 100% Elephant grass was used as inoculum. Total gas production was measured at 3, 6, 12, 18, 24 and 48 hours. The concentrations of CH₄ and CO₂ were analyzed at 12, 24 and 48 hours. The results showed that the *in vitro* total gas, CH₄ and CO₂ production from 0-48 h were significantly different (P<0.05) among the treatments and they were gradually increasing when increasing concentrate levels from 0 to 40%. CH₄ production (ml/g OM) from 0 to 48h was proportional to levels when concentrate was supplementation (0-40%). The *in vitro* DMD and OMD values were also increased (P<0.05) from the C0 to the C40 treatment. Increasing the OMD (%) by an additional 1.0% resulted in a corresponding increase of 4.08, 1.57, 1.93, and 2.15% in CH₄ production (ml/gOM) at 48 hours for the concentrate supplemented with 10, 20, 30, and 40% of total DM fermented, respectively. It was concluded that supplementation concentrate from 0 to 40% to the Elephant grass gradually increased greenhouse gas production. Similarly, the DM and OM digestibility was also increased. The optimal level of concentrate supplementation to Elephant grass as the substrates was 20% (DM basis).

Keywords: concentrate, roughage, greenhouse gas, rumen fluid, gas production.

SITUATION OF AVIAN INFLUENZA EPIDEMIC IN NGHE AN AND THANH HOA PROVINCE DURING 2019 - 6/2023

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The study aims to evaluate and combine with analysis of the epidemiological situation of avian influenza epidemic in Nghe An and Thanh Hoa province to predict possible future developments of the epidemic. The results show that: The vaccination rate in Nghe An province has only reached from 35% to 57%. In Thanh Hoa province, the vaccination is performed better and is maintained every year, reaching a rate of 55% to 90%; In 2020, avian influenza epidemic occurred at a "strong outbreak, widespread spread" level in Nghe An, the remaining epidemics only occurred "locally, small and scattered" in 2 provinces out of 5 year of assessment. In Thanh Hoa province, after 2021, no epidemic will be detected locally; Evaluation of epidemiological characteristics shows that: avian influenza epidemics often occur concentrated from December of the previous year to March of the following year; Overall, over the course of the 5-year investigation, the rate of diseased and destroyed chickens was about 2 times the rate of culled waterfowl (67.04% compared to 32.96%).

To prevent the avian flu epidemic, these provinces need to continue to monitor the circulation of avian influenza virus and warn of the risk of disease outbreaks; Strengthen animal quarantine and transportation control to prevent illegal transportation of poultry and poultry products into the province; Coordinate with People's Committees of districts, towns and cities to accelerate the progress of avian influenza vaccination.

Keywords: avian influenza, Nghe An, Thanh Hoa.