GROWTH PERFORMANCE AND REPRODUCTIVE PERFORMANCE OF VCN15 AND VCN16 PIGS

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The study was conducted at Thuy Phuong pig research and development center (Thuy Phuong), Thai Duong Foreign Pig Limited Company (Thai Duong), and Livestock Training and Development Center (Binh Thang) from January 2016 to December 2019 to estimate the growth performance and reproductive performance of 405 VCN15 pigs and 405 VCN16 pigs. VCN15 and VCN16 had high growth performance which an average daily gain was 840.9 g/day (VCN15) and 839.6 g/day (VCN16). Loin muscle area of female VCN15 was 48.9 mm (Thuy Phuong), and 50.8 mm (Thai Duong). The backfat thickness of female VCN15 in Binh Thang was 12.5 mm. Besides, the backfat thickness of VCN16 (Binh Thang) reached 12.9 mm, the lean muscle area of VCN16 in Thai Duong was 50.0 mm, and the lean meat percentage of VCN16 in Thuy Phuong and Thai Duong were both reached 58.4 mm. In addition, the reproductive performance of VCN15 and VCN16 were high. The number born alive of VCN15 and VCN16 were 12.3 and 13.22 mm, respectively. The total pig/sow/year of VCN15 and VCN16 were 27.28 and 27.22 pigs (Thai Duong), 27.75 and 27.8 pigs (Thuy Phuong), and 27.61 and 27.41 pigs (Binh Thang), respectively.

Keywords: *VCN15, VCN16, growth performance, reproductive performance*

DETERMINING THE APROPRIATE TIME OF SLAUGHTER FOR MONG CHICKENS

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The aim of this study was to determine the appropriate timing of slaughter on 100 Mong chicken from 1 to 36 weeks of age, numbered to follow individuals. Chickens are kept in captivity 1-8 weeks of age using mixed feed 3,200 ME / kg and 21% protein; 9-20 weeks of age, using mixed feed of concentrated feed and corn 3,199 ME / kg and 16.2% protein; and 21 - 36 weeks of age, using feed mixturewith corn 3,039 ME / kg and 12.38% protein. Research results show that, according to body weight, the Mong chickens can kill meat at 20 weeks onwards, then the weight is equivalent to the market-killing chicken with a carcass weight of about 1.5. kg. Based on the daily weight gain, the Mong chickens can be slaughtered from week 12 when the highest daily weight gain is estimated at 16.30 g / day. Based on breast meat thickness, Mong chickens can kill meat from week 24 onwards because the thickness of breast meat has reached the optimal level and remains stable. Based on the FCR, the Mong chickens should be slaughtered before 24 weeks of age because after this stage the feed consumption per kilogram of weight gain is very high above 16.56 kg; Based on crude and net profit also shows that Mong chickens should kill meat before 24 weeks of age, by this point both crude and net profit have been zero and gradually decreased in the following weeks. According to local tradition, Mong chickens are usually slaughtered between 22 and 28 weeks of age (50.43%). Synthesizing all the criteria, the hen that is around 24 weeks old is suitable when its body weight reaches 2438 g with an increase of 11.6 g / day, FCR 17.66 kg feed for kg increased weight,breast meat thickness 18.86 mm and net profit 0.234 VND / day estimated from the regression function.

Key words:*Mong chicken, time of slaughter, breast meat thickness*

GROWTH PERFORMANCE AND FEED INTAKE OF CROSSBRED BACH THAO GOAT RAISED IN SEMI - INTENSIVE SYSTEM IN TRA VINH CITY

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This study was carried out from 20th August to 30th September 2020 at experimental farm in veterinary husbandry of Tra Vinh University. Twelve crossbred Bach Thao goats from 5 to 6 month - age was devided into 3 treatments by completely radom method which was supplement mixture concentrated feed in different level of

crude protein (16.56%CP, 18.11%CP and 19.22%CP) and repeating 4 times for every treatment. Goats were raised in semi - intensive system and combining with consideration environmental temperature and humidity of house. Result showed that floor and corner barn temperature constant more than outside, arrange from 29.66 to 30.04 celsius degree, especially higher 4.16 percentage with relative humidity at the corner than on floor of house. Generally animal response well for hot climate of location, result show that crossbred goats gain weight from 99.55 to 131.59g/head/day that significantly different between 3 treatmens ($P < 0.05$). This result indicates that quality of forage in rain reason was better than other so goatsof experiment have achieved suitable growth ability. Forage use efficiency was the best with 19.22%CP treatment (6.85kg dry matter intake/kg moderate weight gain). Simultaneously crude protein consumed/kg moderate weight gain in this of animal was also more efficient than others (0.84kg/kg moderate weight gain). From these results of experiment that can suggestmethod improve quality of forage on way supplement concentrate feed into diet to increase livestock performance and efficience.

Key words: *Bach Thao goat, environment temperature and humidity, dry matter intake, weight gain*

DETERMINING THE PPTIMAL TIME TO HARVEST CORN AND CORN SILAGE METHOD FOR LIVESTOCK

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Two experiments were conducted from July to December 2019 at Ruminant Ressearch and Development Center to determine the optimal time to harvest and the silage method for LVN-10 corn stalks. In the first experiment, experimental layout completely randomized in 3 treatment was repeated 3 times: T1 - Harvesting corn at the mature seed stage: T2 - Harvesting corn plants at the mature seed stage: T3 - Harvesting corn plants at the horseshoe seed stage. In the second experiminent 2: Experimental layout completely randomized in 3treatment was repeated 3 times with different levels of additive addition: M1 – additional 0.5% salt; M2 – additionnal 0.5% salt + 3.0% molasses; M3 – additionnal 0,5% salt + 0.2% urea. Research results showed that harvest corn LVN - 10 at stageripe corn kernel had the best for productivity 45.1 tons/ha and nutritional value DM, CP, EE about 10.5; 0.77 and 0.16 tons/ha. ME value about 24314.1 kcal. LVN – 10 corn stalks additional incubation 0.5% salt + 3% molasses for best quality, products are yellowish green and brownish, a mildly sour taste smells good molasses soft and dry and no mold.

Keywords:*LVN – 10 corn, harvest time, silage method.*

EFFECTS OF CONCENTRATE FEED SUPPLEMENTS ON BODY WEIGTH GAIN OF BAO YEN BUFFALO REARED COMMERCIALLY IN THE PERIOD OF 13 – 24 MONTHS AGE

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Bao Yen buffalo from 13-24 months of age was conducted for experiment in Xuan Hoa and Vinh Yen commune, Bao Yen district, Lao Cai province from August 2017 to August 2018. The experiment was arranged according to completely randomized block method. The average body weight of 15 13-month-age buffalos was 170 to 173 kg, divided into 3 groups, 5 buffalos in each group with equal body weight. Concentrate feed was added to 3 experimental groups with 3 levels of 2.3 kg; 2.6kg and 2.0kg. Results of experimental rearing showed that the supplementation of concentrate feed 2.6 kg /buffalo/ day to the ratio of commercial buffalo Bao Yen at the period of 13 to 24 months age was the best. Total body weight gain of commercial buffalo Bao Yen of experimental group 1, experiment 2 and experiment 3 was 155.96 kg; 166.65 kg and 140.10 kg. Daily body weight gain was 433.33 g/buffalo/day, 462.29 g / buffalo/ day and 389.21 g /buffalo / day, respectively.

Keywords: *Bao Yen buffalo, concentrate feed, body weight gain*

EVALUATE THE EFFECT OF FARMING PRACTICES IN SMALL-SCALE FARMS TO RUMEN ACIDOSIS IN DAIRY COW

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The study was conducted to assess the current situation of livestock production and the situation of rumen acidosis in small-scale dairy farming in Vietnam. The research conducted on 135 small-scale livestock farms in the North, Central and South from 2017 to 2019. The survey results showed that 65.42% of cows were raised, locked in barns, forage and forage separately 80.38% and milk yield over 5,000 liters / cycle of 305 days accounting for 70.39% in small-scale farms. The method of feeding concentrate and forage separately had a significant effect on the prevalence of rumen acidosis in the herd of 12.24%. Increased milk yield affects the incidence of rumen acidosis. The results of this study show an overview of the current situation of small-scale dairy farming in relation to rumen acidosis and from there appropriate preventive measures.

Keywords: *Breeding methods, Ruminal acid, dairy cow, farm, milk.*

RABBIT PRODUCTION UNDER GLOBAL CRISIS OF CLIMATE CHANGE AND COVID-19 PANDEMIC

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Under a dramatic loss of human life worldwide and an unprecedented challenge to public health, food systems and jobs by the COVID-19 pandemic, the objective of this review paper is to introduce rabbit production as a good future perspective of food production with the widen urbanization areas, narrower agricultural lands and seriously epidemic diseases for animals and human beings. Rabbit production is easy to apply modernized and automatic systems with low water consumption, environmental pollution and producing areas. However it produces more meat products in a production unit compared to these of other animal species. Rabbit is an herbivore species, which produces lower greenhouse gases compared to ruminants. The COVID-19 pandemic caused health and human crisis threatening the food security and nutrition people around the world and its relation to rabbit outbreaks are also presented in this paper.

In recent years rabbit population continue to increase in the developing countries such as China, Indonesia, Vietnam, etc. for improving meat production by better use of green forages as compared to the developed ones. However in many farms in Italia, France, Germany, etc. the rabbit production is applied the modernized feeding systems and improved breeds with higher performance.With the increasing human population in the big cities, animal production systems in the urban areas to supply foods for them are necessary to change from the high to the low pollution, but higher yield and quality of products. Therefore a selection of animal species for raising to improve food production and human livelihood, and to adapt to negatively global changes is necessary.

Keywords*:* *animal protein, drought, greenhouse gases emissions, outbreak**,** rodent, solution.*

EFFECTS OF TRIBUTYRIN IN DIET ON EGG PERFORMANCE AND QUALITY OF HENS IN THE LATE STAGE OF LAYING CYCLE

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An experiment was conducted to determine the effect of diet supplementing with tributyrin (TB) in different levels in diet on egg performance and quality of laying hens from 55-65 weeks age. A total of 960 Hisex Brown laying hens at the 55 weeks of age were randomly distributed in a completely randomized design experiment, with 4 treatments and 3 replicates, each replicate consisted of a line with 20 pens (4 birds/pen). The experimental data was collected during 10 weeks. Treatments used: (1) Control (Cont): Basal diet (B) without any supplementation; (2) TB0.5: B + Tributyrin at 0.5 g/kg feed; (3) TB0.75: B + Tributyrin at 0.75 g/kg feed; (4)

TB1.0: B + Tributyrin at 1.0 g/kg feed. The results showed that, average daily feed intake was not affected by tributyrin supplementations in the diets (P>0.05). But a little improvement hen day production, egg mass and egg weight in TB0.75 and TB1.0 compared to TB0.5 and Cont group. Tributyrin supplementation significantly increased eggshell thickness (P < 0.01), and the higher yellow color of egg york was found in chicken eggs fed TB0.75 and TB1.0 treatments. In conclusion, adding tributyrin at 0.75 and 1.0g/kg feed could trend lightly improved hen day production, egg shell thickness, and egg york color and feed conversion ratio compared to control group of laying hen in the late state of laying cycle.

Keywords: *Hen- day production, Hisex Brown, laying hen, Tributyrin*

EFFECT OF DIETARY LEVELS OF CONCENTRATE SUPPLEMENTION ON FEED INTAKE AND NUTRIENT DIGESTIBILITY OF CROSSBRED CATTLE (BRAHMAN × ZEBU) FROM 13-15 MONTHS OF AGE IN AN GIANG PROVINCE

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Five cattle crossbred (Brahman × Zebu) at 13 months of age were in a Latin square design with 5 treatments and 5 periods to evaluate the effect of dietary levels of concentrate supplementation on feed intake and nutrient digestibility. Five treatments were 5 supplement levels of concentrate in the cattle diets at 0, 0.5, 1.0, 1.5 and 2.0 kg/head/day corresponding to C0, C0.5, C1.0, C1.5 and C2.0 treatments. Fresh elephant grass was fed at 5 kg/head/day, while rice straw was fed *ad libitum* for all treatments. One experimental period lasted 14 days with 7 days for adaptation and 7 days for sampling. The results showed that the dry matter (DM), organic matter (OM, crude protein (CP), neutral detergent fiber (NDF) and metabolic energy (ME) intakes were significant among diets. The DM intake was significantly different (P<0.05) among the treatments with the highest value for the C2.0 treatment (4.36 kg/head/day) and the lowest for the C0 treatment (2.98 kg/head/day). The crude protein intake was significantly different (P<0.05), the highest value was for C2.0 treatment (444g) following by C1.5 (379g), CP1.0 (326g), CP0.5 (252g) and C0 (188g) treatments. The ME intake was significantly improved (P<0.05) by increasing concentrate supplementation levels from C0 (24.3 MJ/head/day) to C2.0 (41.2 MJ/head/day). The DM digestibility of C1.0 treatment was not significantly different with C0 and C0.5 treatments but it was significantly lower (P>0.05) comparing to C1.5 and C2.0 diets (61.6% vs 58.1, 58.7, 64.5 and 66.6%, respectively). The CP digestibility of C2.0 treatment (76.9%) was slightly higher (P>0.05) than that of C1.5 and C1.0 diets (73.0 and 67.6%, respectively) but it was significantly higher (P<0.05) compared to C0 and C0.5 diets (54.1 and 64.8%, respectively). The conclusion was that growing Brahman crossbred fed dietary concentrate level at 1.0-1.5 kg/head/day tented to improve total DM intake and crude protein digestibility.

Keywords:*Ruminants, nutrient utilization, digestion, growth.*

EFFECTS OF METABILIZABLE ENERGY TO PROTEIN RATIOS IN DIET AT 1 TO 21 DAYS OF AGE ON PRODUCTION PERFORMANCE AND CARCASS CHARACTERISTICS OF F1 MIA × LUONG PHUONG CHICKEN

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An experiment was conducted to determine the optimal ME and CP ratios for F1 (Mia × Luong Phuong) chicken based on growth performance from 1 to 21 days of age and second, further investigate the influence of body weigh at day 21 on growth performance and carcass traits of F1 (Mia × Luong Phuong) chicken from 22 to 84 days of age. Two hundred dayold F1 Mia × Luong Phuong chicks were randomly allotted to treatments following a Randomized Complete Block Design. There were 4 replicates per treatment with 10 birds in each cage. The treatments used were four ratios of metabilizable energy (ME) to crude protein (CP) in diet of 150, 142.5, 135.7, 129.5 and 123.9. Result showed that there were significant differences in body weight (BW), body weight gain (BWG), average daily gain (ADG), Feed conversion ratio (FCR) among chicken groups fed diets containing different ME to CP ratios. There were no significant differences observed for average daily feed intake (ADFI) and acceptability across treatment. Crude protein efficiency of chicks fed diets containing ME to CP ratios of 142.5 or 135.7 were better (P<0.05) as compared to those fed diets containing 150, 129.5 and 123.9 of ME to CP ratios. While ratio of ME to CP in booster diets did not effect on the growth performance of grower, finisher phases and carcass yield.

Keywords: *booster diets, chicken, colorchicken, protein in diet, metabolizable energy.*

EFFECTS OF SUPEROXIDE DISMUTASE AND CATALASE SUPPLEMENTATION ON SEMEN QUALITY OF MULTI-SPURS CHICKEN IN LIQUID STORAGE

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This study aimed to investigate the effects of enzymatic antioxidants superoxide dismutase (SOD) and catalase supplementation on semen quality of multi-spurs chicken during liquid storage up to 48 h at 4°C. Pooled semen of twelve Vietnamese multi-spurred roosters was randomly divided into 7 experimental groups: control without supplement; SOD supplemented at 100 UI/mLor 200 UI/mL; catalase supplemented at 200 UI/mLor 400 UI/mL, and combination of 100 SOD + 200 catalaseUI/mL or 200 SOD +400 catalaseUI/mL.The highest quality treated semen was selected base on the semen motility, viability, abnormality at 0 h, 24 h, and 48 h of storage, and evaluated the fertility in comparison with control group. The results showed that the motility and viability of stored sperm were increased by the addition of 200 SOD + 400 catalaseUI/mL. Moreover, the fertility of stored chicken sperm was increased ($p<0.05$) compared to that of control treatment. In conclusion, the supplementation of 200 SOD +400 catalaseUI/mL improved the motility, viability, and fertility of multi-spurs chicken sperm during liquid preservation after 24 h and 48 h.

Keywords: *chicken semen; liquid storage; antioxidant; reactive oxygen species*

A RESPONSE OF NUTRIENT INTAKES, FEED CONVERSION RATIO AND DIGESTION OF MEAT RABBITS ON DIETARY FIBER LEVELS

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It was a complete randomized design with six treatments and three replicates, which was implemented with different levels of neutral detergent fiber (NDF) at 37, 41, 45, 49, 53 and 57% corresponding to the treatments of NDF37, NDF41, NDF45, NDF49, NDF53 and NDF57, respectively to evaluate growth performance and nutrient digestibility of growing crossbred rabbits for applications. Two female and two male rabbits at 54 days of age were allocated in one experimental unit. The results showed that in Exp 1 the dry matter (DM) and organic matter (OM) intakes were significantly increased ($P<0.001$) when increasing levels of NDF in the diets. The crude protein (CP) intake was the lowest value in the NDF57 diet ($P<0.001$). The NDF and ADF intakes were significantly increased ($P<0.001$) when increasing levels of NDF in the diets. The daily weight gain was significantly decreased ($P<0.001$), the daily weight gain in the NDF41 treatment (20.3g/rabbit/day) was higher than this in theNDF45, NDF49, NDF53 and NDF57ones, however, the lower feed conversion ratiowas found ($P<0.05$) in the NDF37 treatment (3.45). In Exp 2 the coefficient of total tract apparent digestibility of DM, OM, NDF and acid detergent fiber (ADF) decreased when levels of NDF increased in the diets ($P<0.05$). The nitrogen intake of NDF37 treatment was higher than that of the NDF57 one ($P<0.05$), while the retained nitrogen (g/kgW0.75) of rabbits hada linear relationship with the NDF levels (%) with $y=-0.008x + 1.21$ ($R2= 0.928$, $P=0.002$ and $SE=0.020$). It was concluded that increasing levels of NDF in the diets of the meat rabbits reduced daily weight gain and nutrient digestibility andat a level of 41 % NDF in diet gave better growth performance and dietary nutrient utilization.

Keywords:*daily weight gain, digestibility, growing rabbit and neutral detergent fiber.*

ECONOMIC EFFICIENCY IN BEEF CATTLE PRODUCTION UNDER DIFERENT SYSTEMS AT WESTERN HIGHLAND OF VIETNAM

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The objective of this research was to investigate the economic efficiency of beef cattle production according to three various systems in Western Highland of Vietnam. Three systems were applied as traditional grazing system (TGS), semi-intensive system (SIS) and nomadical grazing system (NGS).

Total of 1,160 cattle, out of which 512 cows, 20 breeding bulls, 628 growing calves (0-24 months old) were observed for data collection from January 2017 to June 2020 of 58 households in Gia-Lai and Dak-Lak provinces. Input expenditures for cattle production were comprised of crude feed, concentration and minerals, health care, breeding and additional expenses. Outputs were comprised of compost and calfsellings. Procedures of basic statistics and one-way ANOVA in MINITAB16 were applied for analyzing inputs, outputs and revenue per household and cow.

The results indicated that by household, the highest total output was 133.64 million Vietnam Dongs (mVND)/household/year and found in NGS, the lowest total output was of TGS with 84.75 mVND/household/year; the annual total output of SIS was 91.10 mVND/household/year. The differences between them were statistically significant ($P<0.05$). Whereas, the annual revenues per cow including labourcost and gross investment, excluding labour cost and gross investment interest were usually the highest estimates in SIS: 13.37 mVND/cow/year (including labour cost and gross investment); 10.05 mVND/cow/year (excluding labour cost); 8.30 mVND/cow/year (excluding labour cost and gross investment interest).

The SIS has shown the best choice for beef cattle production. It should be taken into account for extension in Western Highland of Vietnam.

Keywords: *Beef cattle, beef production system, economic efficiency.*

HUMAN AND SOCIAL CAPITAL IN PROMOTING LIVELIHOOD FOR BEEF CATTLE PRODUCTION HOUSEHOLDS IN DIEN BIEN PROVINCE

Vol 120. Febuary, 2021. Pp. 74-82

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Beef cattle production is a potential livelihood for people in remote area in Dien Bien province to promote the living quality. The efficiency of this livelihood depends greatly on different available resources in which human and social capital are among the most important. While human capital deals with demographics, labor, age, educational level and livelihood experience, social capital includes the participation in social organisations, community links, market connection, credit accessibility, livelihood public and private services. The research is conducted in two districts of Dien Bien province: Tuan Giao and Dien Bien. At present, the most popular beef cattle production method is free-grazing system which is labor-intensive, nature-dependent and time-consuming. In order to develop better beef cattle production livelihood to bring more benefits for farmers in Dien Bien province, their capacity and involvement in social organisations should be enhanced to get better knowledge on beef cattle production and market information while communication for farmers in beef cattle production value chain and technology should bestrengthened.

Keywords*: Beef cattle production, Dien Bien, human capital, social capital, livelihood*

PRELIMINARY RESULTS ON *IN VITRO* GAS PRODUCTION IMPACTED BY DIFFERENT FAECAL SOURCES OF ANIMAL SPECIES USED AS INOCULA

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The objective of this study was to evaluate effect of faeces sources used as inocula on*in vitro* gas production for future applied studies. The experiment was conducted at Department of Animal Sciences, College of Agriculture of Can Tho University. It was a factorial design (5*4) with 4 replications. Factor 1 was five sources of faeces from buffalo (BF), cattle (CF), pig (PF), goat (GF) and rabbit (RF). The factor 2 was 4 feeds including Para grass (PG), *sesbania grandiflora* (SG), rice straw (RS) and pineapple peel (PP). The measurements of gas production were at 3, 6, 9, 12, 24, 48, 72 and 96 h. The results showed that gas production of five source of faeces were significantly different ($P<0.05$) among them. At 12, 24, 48 and 96 h gas production of GF was the highest values and significantly higher ($P<0.05$) compared to BF and RF.The *in vitro* gas production of PP was the highest values and significantly different ($P<0.05$) to PG, SG and RS at 24, 48 and 96 h of incubation. The conclusion was that all faecal sources of the study could be used as inocula for in *in vitro* gas production and goat faeces was the most potential for applications.

Keywords: *faeces, feed, gas production, microorganism, in vitro*

POLYMORPHISMS OF CANDIDATE GENES AND THEIR ASSOCIATION WITH INTRAMUSCULAR FAT IN DUROC PIG

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This study aimed to determine single nucleotide polymorphisms (SNPs) in four candidate genes: Fatty Acid Binding Protein 3 (*FABP3*), Adrenoceptor Beta 3 (*ADRB3*), Perilipin 2 (*PLIN2*), and Acyl-CoA Synthetase Long-Chain Family Member 4 (*ACSL4*) as well as anassociation between these SNPs and intramuscular fat (IMF) in Duroc pig population. A total of 200 pigs was collected, and DNA samples were extracted. The PCR-RFLP method was used to analyze five SNPs, including *FABP3-Hinf*I, *FABP3-Bsrf*I, *ADRB3-Taq*I, *PLIN2-Mva1269*I and *ACSL4-Rsa*I.A General Linear Model was used to evaluate the association between SNPs and IMF. Results estimated the frequency of alleles and genotypes for SNPs in these candidate genes. While only two genotypes were found in three SNPs, *FABP3*/*Hinf*I, *PLIN2*/*Mva1269*I, and *ACSL4*/*Rsa*I, SNP at *ADRB3*/*Taq*I indicated three different genotypes, and the SNP at *FABP3*/*Bsrf*I was homozygous. All homozygous genotypes of SNPs accounted for higher frequency except the SNP of *ADRB3*/*Taq*I. However, they had no significant association between the SNPs and the IMF in experimenting with the Duroc pig population.

Keywords:*Duroc pig, Intramuscular fat, single nucleotide polymorphism, genetic marker, FABP3*, *ADRB3*, *PLIN2*, *ACSL4*.

PRELIMINARY RESULTS OF INVESTIGATED URINE PURINE DERIVATIVES AND MICROBIAL NITROGEN SYSTHESIS OF DOMESTIC HERBIVORES SELECTED IN MEKONG DELTA OF VIETNAM

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The objective of the investigation was to determine different potentials of urine purine derivatives (PD) and estimated microbial nitrogen synthesis (MNS) in domestic herbivores raised in the Mekong Delta for future applications. The domestic herbivores used in the study included 4 buffaloes (284 ± 12.3 kg), 4 cattle (146 ± 8.6 kg), 6 goats (21.1 ± 3.76 kg),6 sheep (21.5 ± 4.27 kg) and 10 rabbits (1.88 ± 0.023 kg). Diet used for feeding buffalo was rice straw, natural grass, *sesbania grandiflora* andurea-molasses, for cattle was rice straw mixed with molasses and minerals, for goat was Para grass, for sheep was *panicum maximum* and concentrate and for rabbit was Para grass, sweet potatoes vines and concentrate. The investigation period was 3 weeks with 2 weeks for dietary adaptation and one week for measurements.

The results showed that daily excretions of allantoin, uric acid and purine derivatives (mmol/kgW$^{0.75}$) in urine and estimated MNS (gN/kgW$^{0.75}$) of the animals were variable among the herbivore species. The MNS (g/kgW$^{0.75}$) were 1.11, 0.479, 0.123, 0.112 and 0.038 for buffaloes, cattle, sheep, rabbits and goats. Although the CP intake (g/kgW$^{0.75}$) of rabbits was higher than cattle, sheep, buffalo and goats, the PD (mmol/kgW$^{0.75}$) were higher for the cattle (0.705) and buffaloes (0.384) compared to the others. Especially in case of buffalo the urine PD excretion and MNS produced could be driven by the characteristics of its physiology and nutrient metabolisms. It was preliminarily concluded that PD excretion and the estimated MNS of the herbivores were crucially influenced by different species and protein intake level.

Keywords:*excretion, ruminals, feed intake, digestion*

IMPROVE PRODUCTIVITY, QUALITY OF FORAGE CROPS AND RESEARCH DIRECTION

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Green fodder crops play an important role in breeding for ruminant animals. Animal feed that can be fed directly through cutting or grazing or dry processing makes up most of the daily diet, supplementary feed is used to

compensate for nutritional deficiencies in providing forage, increasing animal performance during certain periods. Therefore, the yield and quality of green food crops have a great impact on economic efficiency in livestock production.

Despite being an important crop, research on forage is limited when compared to cereal crops, fruit trees and vegetables. This article summarizes the literature highlighting the importance of forage crops, current improvements and some future directions for improving the performance and nutritional quality of forage crops. The research results obtained from the cereal crop can be applied to the forage crop. The timely development of genomic technology and bioinformatics along with genomic editing techniques provide great scope for improving crops for forage. Given the social, environmental and economic importance of forage crops globally and especially in poor countries, this opportunity has immense potential for improved food security and stability economic development.

Keywords: *forage, nutritional enhancement, grass production, legumes, breeding, management*

ASSESSMENT OF DISTRIBUTION AND APPEARANCE CHARACTERISTICS OF LONG XUOC CHICKEN IN HA GIANG PROVINCE

Vol 121. March, 2021. Pp. 22-30

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The objective of the study is to evaluate the distribution and appearance characteristics of Long Xuoc chickens in Ha Giang province, thereby having a basis for selecting Long Xuoc chickens with specific appearance characteristics for the purpose of breeding exploit and develop genetic resources of this chicken breed. Survey on 216 households raising Long Xuoc chickens in 4 upland communes (Quan Ba, Yen Minh, Dong Van, Meo Vac) found that: scale ≥ 10-20 chickens/household was most commonly raised (43.06%), followed by size <10 chickens/household (32.87%), > 20-30 chickens/household accounting for 22.22%; Only 1.85% raise with the scale ≥ 30 chickens/household; The main method of raising is grazing (97.37%), with cages (88.43%) with materials for making cages is bamboo and neohouzeaua (78.53%); The source of food for Long Xuoc chickens is mainly from agricultural production: broken corn, paddy, rice bran (93.06%), very few (6.48%) households use mixed feed with home-made feed (broken corn, paddy) and only 0.46% of households use mixed feed for scratched chicken. Adult Long Xuoc chickens have basic physical characteristics: The male has dark yellow head, neck, back, chest purple, black tail (79.69%), female has dry banana leaf color (79.45%), the rest has light yellow hair, white, black, mixed. The feathers of the rooster and the hen are scratched all over the body. Most roosters and hens have a crest pattern (85.94% and 83.56%) with the main magenta color (87.50% and 91.78%). The skin of the long xuoc chicken feet is lead-colored, and a few are white.

Keywords: *Long Xuoc chicken, household, external, crest, food*.

EVALUATION RESULTS FOR APPEARANCE CHARACTERISTICS AND PRODUCTIVITY OF THE NAKED NECK CHICKEN BREED IN QUE PHONG DISTRICT, NGHE AN PROVINCE

Vol 121. March, 2021. Pp. 31-40

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This study is aimed to be a first step in assessing the appearance characteristics, growth ability, and reproductive productivity of Naked neck chickens that are conserved at Na Sai village, Hanh Dich commune, Que Phong district, Nghe An province from 2019 to 2020. Results showed that the Naked neck chicken has appearance characteristics at one day of age with pale yellow and yellow-brown hair, with black spots on the head, tail, and wingtip, long neck and hairless; pale yellow skin, beak, and legs. At 20 weeks, males have a larger body than females, with a variety of feather colors, round eyes, the golden black, curved and hard beak. Especially, the upper side of the neck extending from ear to body completely hairless, the underside of the neck has a bunch of feathers attached to the body, bright red face and neck skin, a long, curled tail, and blue-black. Females have a

slimmer and lighter body than males, round eyes, black and yellow beak, pale pink face and neck skin, and the neck area is also hairless. Naked neck chickens have a survival rate at 20 weeks of age of 79.33%. The body weight at 8 weeks of age was 658.13 and 557.67 g/head for males and females. At 20 weeks of age, the males and females reached 1,382.97 and 1,116.83 g/head, respectively. The Naked neck chicken has the age of laying the first egg at 182 days and reaches the peak at 257.50 days of age. Egg production per 52 laying weeks was 24.35 eggs/head, corresponding with a laying rate of 6.87% and FCR/10 eggs were 10.62 kg. The rate of fertile eggs was 88.85%; the rate of hatching/incubation eggs was 70.87%.

Keywords: *Naked neck chicken breed, productivity, egg productivity*

DETERMINATION OF THE APPROXIMATE PROTEIN LEVEL IN FOOD FOR "SEN" MUSCOVY DUCK OF REPRODUCTION

Vol 121. March, 2021. Pp. 41-54

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The experiment was conducted on 1,350 "Sen" muscovy ducks for breeding and was conducted at Dai Xuyen Duck Breeding and Research Center. Starting from 1 day of age, experimental muscovy ducks were wearing the number of wings each, were kept completely in a cage (with barn filler) with a naturally ventilated playground. Experiments to determine the appropriate protein level in the muscovy duckling, prepare laying and laying stages with different protein levels at the duckling stages (0-4) weeks of age including: 19; 20 and 21%, ME 2900 kcal/kg; 5-8 weeks of age including: 17; 18 and 19%, ME 2900 kcal/kg; prepare laying stage (9 - 26 weeks of age) includes: 13; 14 and 15%; ME 2900 kcal/kg; laying stage (27 - 78 weeks of age): 15; 16 and 17% ME 2650 Kcal/kg, arranged in 3 experimental groups: Treatment 1 (at 19% - 17% - 13% - 15%); treatment 2 (20% - 18% - 14% - 16%); treatment 3 (21% - 19% - 15% - 17%) corresponding to the protein level arranged in the stages of duckling (0 - 4 weeks of age and 5 - 8 weeks of age) - prepare laying - laying. The results show that: Sen muscovy duck breeding in experimental group 2 had the highest results: the rate of feeding the duckling and gilts stage was 92.22%, the body weight of Sen muscovy duck at 26 weeks of age was 3124.01 gram/male and 2031.53 gram/female, egg production 89.18 eggs /female/ 52 weeks of lay, feed consumption of 6.88 kg/10 eggs, the rate of eggs with embryos was 95.67%; hatching rate/number of eggs with embryos 86.87%; The hatching rate/total eggs hatched was 82.00% and the hatching rate 1/number of ducklings hatched was 92.68%. Economic efficiency was 69,842,574 VND, interest /female 310,411 VND, mixed income index (MI), profit (Pr), mixed income / total cost and mixed income / labor. reaching the highest level in the experimental lot 2 with the corresponding indices of 107,342,574 VND; 83,382,574 VND; 0.50 and 4.47. Use of feed with protein level at 20% and 18% duckling, 14% prepare laying and 16% laying stages Sen muscovy duck breeding is most effective.

Keywords: *Protein, Sen muscovy duck, reproduciton, economic efficiency*.

STUDY ON INITIAL ASSESSMENT OF THE PRODUCTION CAPABILITY AND QUALITY OF FROZEN SEMEN PRODUCED FROM CHIEM HOA BUFFALO SEMEN

Vol 121. March, 2021. Pp. 55-64

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The research was conducted to produce and preserve semen from 05 buffalo bulls, selected from the Chiem Hoa buffalo herd in 2018. The research site is at the Mountainous Livestock Research and Development Center. The female buffalo was bred with artificial insemination in Chiem Hoa district - Tuyen Quang and Thai Nguyen. Research period is from January 2019 to December 2020. Research content: Evaluating the production ability and quality of straw of semen frozen produced from Chiem Hoa buffalo semen; Insemination and fertility assessment of straw semen when mating on female buffalo herds in Tuyen Quang and Thai Nguyen. The study results showed that: The average number of standard straws produced is 127.94 straws per one time semen

production(ranging from 88.41 to 199.70 straws per one time semen production). Chiem Hoa buffalo straw semen has good quality. The sperm motility after freezing is 48.85% in average; sperm post thaw motility after 12 months of preservation decreased 0.16%. The conception rate at the first artificial inseminationof the Chiem Hoabuffalo semen frozen with the local female buffalo reached 50.67%. It is rated well, meeting current local breeding requirements.

Keywords: *Production ability, spermatozoa, sperm quality, Chiem Hoa buffalo*

THE PREVALENCE OF CANINE GASTROINTESTINAL NEMATODES AND ANTHELMINTICS EFFICACY IN TRA VINH PROVINCE

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The prevalence of gastrointestinal nematodes and anthelmintics efficacy in dogs were carried out in Tra Vinh City, Chau Thanh and Duyen Hai districts of Tra Vinh province from 01 September 2019 to 15 December 2020.The percentage of gastrointestinal nematodes infection of dogs from 540 fecal samples was amount of 68.3% by using floatation technique. The classification and identification results of these helminth eggsby using classical parasitological techniques presented that the primary parasites in those locations of this study were *Toxocara canis* (61.1 %)*, Ancylostoma caninum*(53.5%),and *Trichocephalus vulpis*(40.2%). In addition, the infection rate of these worms was parallel increase in the age of dogs, and it depended on the feeding methods with 63.0% for semi-grazing and 73.7% for free-roaming models. Moreover, bythe necropsied method of 270 canine gastrointestinal tract samples, the infection of these parasites in dogs was 80.7% and the main five species were found including *Ancylostoma caninum* (65.9%), *Toxocara canis* (64.1%), *Trichocephalus vulpis* (53,7%), *Ancylostoma brazilliense* (15.2%), and*Spirocerca lupi* (11.9%). The infection results in this method were also parallel rise in the age of animals, and the proportion of these nematodes infection in semi-grazing dogs and free-roaming dogs were 75.6% and 85.9%, respectively. To deworm these parasites, Levamisole (75mg/20kg body weight) and Bivermectin 0.1% (1ml/3kg body weight) were injected subcutaneously. The results showed that these anthelmintic drugs could exclude the egg of these worms after 10 days of deworming and these drugs were safe and have no side effects during treating.

Keywords:*gastrointestinal nematodes, prevalence, anthelmintics efficacy, dogs, Tra Vinh*

ASSESSING THE EFFECTIVENESS OF *MYCOPLASMA SUIS* INFECTION TREATMENT IN POST-WEANING PIGLETS

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The study aimed to evalute effects of treating *Mycoplasma suis* in pigs by different kinds of antibiotics on a total of 100 post-weaned pigs, which had confirmed positive with *Mycoplasma suis*, were divided into 4 lots. These pigs of four lots of trial was treated by antibiotics addition to the feed: lot I (flofernicol and doxycycline), lot II (doxycycline), lot III (bactrim), lot IV (doxycycline and bactrim), the drug was given twice, for one week each time, separately one month during the period from post-weaning to 3-month age. The results, were tested by observing Giemsa-stained blood smears and polymerase chain reaction (PCR) testing, showed antibiotic apply had a good effect on reducing the *M. suis* infection intensity, decreased from 2.4 - 3.2 to 1.4 - 2.2 points by observing Giemsa-stained blood smears, and positive ratio of PCR testing decreased from 95% to 45%. At the same time, the results also showed that the use of doxycycline and other broad-spectrum antibiotic combination (Lot IV and I) was more effective than treatment without combination (lot II and lot III) and lot IV showed the best improvement in the treatmentof *M. suis* infection.

Keywords: *Mycoplasma suis, Giemsa-stained blood smears, PCR, Treatment, post-weaning pigs*

GENETIC POLYMORPHISMS OF SOME CANDIDATE GENES ASSOCIATED WITH REPRODUCTION AND GROWTH TRAITS IN HUNG AND MEO INDIGENOUS PIGS

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The purpose of this study was to evaluate allele and genotype frequencies of OVGP1, LIF polymorphic sites related to fertility traits, and GH and IGF1 polymorphisms associated with growth traits in Hung and Meo pig breeds. The study was conducted on 84 Hung sows and 86 Meo sows; 86 Hung and 85 Meo finishing pigs by PCR-RFLP method. It was shown that the OVGP1 gene has 3 genotypes, namely AA, AB, and BB, with the frequency of allele A and B in Meo pigs being 0.783 and 0.217 and in Hung pigs being 0.720 and 0.280. The LIF gene also had 3 genotypes: CC, CT, and TT; the frequency of T and C alleles in Meo pigs was 0.913 and 0.087, respectively and in Hung pigs the corresponding values were 0.880 and 0.120. In addition, 3 genotypes, namely AA, AB, BB were detected in the GH gene, of which the frequency of A and B alleles were 0.700 and 0.300 in Meo pigs and 0.531 and 0.469 in Hung pigs. Finally, AA and AB genotypes were found in the IGF1 gene, with the frequency of allele A and B in Meo pig being 0.553 and 0.447 and in Hung pig being 0.826 and 0.174. Besides, it was shown that at the OVGP1 and LIF loci, the frequencies in Meo breed were in Hardy-Weinberg equilibrium (OVGP1, P=0.339 and P=0.068, respectively). Similar results were also found in the Hung pig breed (OVGP1, P=0.053 and P=0.314, respectively). Moreover, in the Meo pig breed, the genotype frequencies in GH gene were balanced (P=0.680>0.05), whereas those of the IGF1 gene were not (P=0.000<0.05). For the remained polymorphic sites in GH and IGF1 of Hung pig breed, the genotype frequencies were in Hardy-Weinberg equilibrium (P>0.05).

Keywords: *Polymorphisms, OVGP1, LIF, GH and IGF1 genes*

SELECTIVELY STUDY CREATE TWO LINES OF LV CHICKEN OVER FOUR GENERATIONS

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Nguyen Quy Khiem, Pham Thuy Linh, Dao Thi Bich Loan, Tran Ngoc Tien, Le Xuan Son, Nguyen Thi Tinh, Pham Thi Hue, Pham Thi Lua, Pham Thi Kim Thanh, Nguyen Thi Minh Huong and Nguyen Thi Yen

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This study was conducted at the Poultry Research Station of Thuy Phuong poultry research center from 2017 to 2020. From the original LV chickens, raw materials were selected and oriented into 2 lines: LV1 rooster line which with enhancing body weight. LV2 hen line with enhancing egg yield. For the LV1 rooster line, Free feeding until 8 weeks old, weighing the whole flock, rooster chickens choose individuals with high to low body weight, selection rate 14.96-15.35%; hens selection rate 49.68-51.66%. The female line LV2 monitored individual egg production from laying the first egg to 38 weeks of age, selecting individuals with high to low egg yield (68-98 eggs), selection rate 48.17-54.17%. Objectives of the study: male lines, body weight of 8 weeks old rooster ≥1800g/head; hens ≥ 1400g/head. Egg yield/hen/68 weeks of age ≥ 165 eggs. Female line, egg yield/hen/38 weeks of age ≥ 68 eggs. Egg yield/hen/68 weeks of age ≥ 175 eggs. The result through four choosing generations, the LV1 rooster chickens had the body weight per 8 weeks were 1807.70 grams higher 200.91 grams than the beginning generation, the hen chickens were 1413.18 grams higher 83.59 grams than the beginning generation. The heritability coefficientabout body weight was 0.51, the genetic progress of rooster reached 39.54 grams/a generation and hen was 25.16 grams/ a generation. The LV2 chickens with egg yield/ a hen/ 38 weeks reached 69.30 higher than the beginning generation 3.60 eggs. The heritability coefficientabout the egg yield was 0.19, the genetic progress was 1.71 eggs/ a generation.

Keywords*: Choosing, LV chicken, Body weight, egg yield*

RESEARCH ON USING PROTEIN-ENRICHED CASSAVA MEAL AND CASSAVA PULP IN TOTAL MIXED RATION FOR FATTENING CATTLE

Vol 122. April, 2021. Pp. 15-26

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The study was conducted to evaluate the quality of protein-enriched cassava meal and cassava pulp by microbial fermentation technology as well as the efficiency of using protein-enriched cassava meal and cassava pulp in total mixed ration for fattening cattle. Cassava meal and cassava pulp were supplemented with enzyme Kermin at 0.1% (as DM). Dissolve 3 kg molasses and 3 kg urea in 50 liters of water, adjust pH = 5; Add yeast solution, the rate of 5%, stir well, aerate for about 8 hours. After being mixed with the enzyme, materials were mixed with molasses, urea and yeast solution so that there was enough moisture about 60% (50 liters/100kg of material), mix the ingredients with a mixer, leave for 1 hour then put the ingredients in the sealed incubation bag. The bags were kept in the fermentation room, evaluation time: 0 day, 1 day, 3 days, 5 days and 7 days after fermentation. The cattle fattening experiment was conducted on 12 BBB × Lai Zebu crossbred bulls, 18-19 months old. Bulls were divided equally into 2 lots, bulls in Lot 1 were fed TMR using unprocessed cassava meal and cassava pulp, and bulls in Lot 2 were fed TMR using protein-enriched cassava meal and cassava pulp. The study results showed that crude protein of cassava meal and cassava pulp increased from 3.3 and 2.96% to 16.87 and 15.80%, respectively, at day 5 after fermentation, in which true protein was 85.77 and 81.22%, respectively. The number of pathogenic microorganisms such as hemolytic *E. coli, Salmonella, Clostridium perfringens* and *Staphylococcus aurêus* were within the permissible limits. Fattening bulls fed TMR using protein-enriched cassava meal and cassava pulp resulted in higher weight gain and lower feed costs per kg weight gain compared to fattening bulls fed TMR using unprocessed cassava meal and cassava pulp (1,561.1 compared to 1,424.1 g/day and 52,105 versus 63,164 VND/kg weight gain).

Keywords: *F1 crossbed (BBB x Lai Zebu),TMR,crude protein, true protein*

REQUIREMENTS OF METABOLIZABLE ENERGY AND STANDARDIZED ILEAL DIGESTIBLE AMINO ACIDS DAILY INTAKE FOR ACTIVE BOAR

Vol 122. April, 2021. Pp. 27-33

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The aim of the experiment was to demonstrate the optimal of metabolizable energy (ME) and daily standardized ileal digestible (SID) amino acid intake for active boar in Vietnam conditions. A total of 27 active boars (Duroc and Duroc x Pietrain) were used in two-factorial design. The first factor is ME (three levels: 3,000; 3,100; 3,200 kcal/kg) and the second is SID Lys (three levels: 0.7; 0.8; 0.95%) for 9 treatments in 3 replications with one active boar per replicate for each treatment. The crude protein was formulated at 13.5% and the ratios of SID methionine+cystine, SID threonine, SID tryptophan to SID lysine were 70; 70; 20%, respectively for all treatments. The result indicated that the sperm quality of boar was the best at 9,134 kcal ME/kg and 23.58 g SID Lys daily intake.

Keywords*: active boar, ME, SID Lys, semen, sperm*

EFFECT OF DIETARY LEVELS OF NEUTRAL DETERGENT FIBER (NDF) ON FEED INTAKE, NUTRIENTS DIGESTIBILITY, RUMEN PARAMETERS AND NITROGEN RETENTION OF BEEF CATTLE

Vol 122. April, 2021. Pp. 34-47

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The objective of the present study was evaluation to Effect of dietary levels of neutral detergent fiber (NDF) on feed intake, nutrients digestibility, rumen parameters and nitrogen retention of crossbred cattle (Black Angus × Zebu crossbred). It was implemented on 4 male Black Angus × Zebu crossbred cattle with an average live weight of 262±20.5 kg (Mean±SD), which were allocated in a Latin square design with 4 treatments and 4 periods. The treatments were 47, 51, 55 and 59% NDF corresponding to NDF47, NDF51, NDF55 and NDF59 treatments.

Each experiment period was two weeks, 7 days for adaptation to ration and 7 days for collecting and dissecting samples. The results showed that nutrients intake (kg/animal/day) was not significantly different (P>0.05) among treatments. The DM and OM digestibility (%) were substantially different (P<0.05) among the treatments. The digestion of NDF47 treatment was not significantly higher than NDF51 and NDF55 (P>0.05), while NDF47 was substantially different for the NDF59 treatment (P<0.05). At 0h and 3h after the feeding of the beef cattle, pH value, rumen parameters and N-NH3 were not significantly various (P>0.05) among treatments. Nitrogen retention decreased from NDF47 to NDF59 treatments (P>0.05). Also, daily weight gain (g/animal/day) in the NDF47 treatment (822) was not significantly higher (P<0.05) than NDF51 (847), NDF55 (774) and NDF59 treatment (651). The above results explained that increasing NDF from 47 to 59% resulted in decreases DM and OM digestibility (P<0.05), whereas NDF47 was not significantly different with NDF51 and NDF55 treatments (P>0.05). Nevertheless, no differences were found for nutrients intake. Both nitrogen retention and daily weight gain gradually decreased. However, the NDF55 treatment was acceptable. The conclusion that NDF level was 55% in the diet was promising in the application. The likely benefit will be an increase in the utilization of fibrous roughage, rumen parameter and daily weight gain.

Keywords: *Beef crossbreed cattle, feed intake, neutral detergent fiber, digestibility*

THE PREVALENCE OF COCCIDIOSIS IN DOMESTIC RABBIT (*ORYCTOLAGUS DOMESTICUS* L.) IN TRA VINH PROVINCE AND THE ANTICOCCIDIOSIS

Vol 122. April, 2021. Pp. 48-56

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The study "The prevalence of coccidiosis in domestic rabbit (*Oryctolagus domesticus* L.) in Tra Vinh province and the anticoccidiosis" was carried out of 2 locations: Tra Vinh city and Cang Long district, Tra Vinh province from 30 April 2020 to 30January 2021. Besides that this study also support the basic scientific knowledge to the veterinarians and farmers about the prevalence of coccidiosis in rabbits and the efficacy of anticoccidial drugs that contribute the income enhancing for farmers. A total of 400 rabbit fecal were examined by salt floatation techniques of Willis, the research results showed that rabbits were infected with an average rate of 67.5%. Both two investigationally locations were infected oocysts, Tra Vinh city was 76.0% and Cang Long district was 59.0%. The prevalence of infection was decreased according to the age of rabbits, the highest was 30 - 60 days of age (89.0%) and the lowest was over 120 days of age (49.0%). The infected rate of rabbits in the farms with better veterinary hygiene was 34.0% lower than the farms with lower veterinary hygiene (98.0%). The normal rabbit fecal infected with 46.0% and liquid fecal infected *Eimeria* species with 89.0%. The hightest infection rate was in dry season (96.0%) and the lowest infection rate was in rainy season (39.0%). Rabbit in Tra Vinh infected with 5 kinds of oocysts including *Eimeria media* (46.8%), *Eimeria magna* (38.0%), *Eimeria perforans* (25.8%), *Eimeria irressidua* (23.0%) and *Eimeria stiedae* (13.0%). The Baycox 2.5% at the dosage of 10 mg/kg bodyweight and Via.Coccid at the dosage of 1 mg/5 kg bodyweight has been shown to be 100% highly effective in deworming after 6 and 10 days, respectively. There was safe medication with no side effects in both two drugs during the experimental period.

Keywords: *coccidiosis, Eimeria, rabbit, Tra Vinh, infected rate,Via.Coccid, Baycox 2,5%*

EFFECT OF TEMPERATURE, RELATIVE HUMIDITY, LIGHT INSENSITY AND SOUND INSENSITY LEVEL IN SWIFTLET'S HOUSE ON NEST YIELD

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The arm of project is to determine the environmental parameters in term of temperature, relative humidity, light intensity and sound insensity level in swiftlet's house to have the highest yield of bird'nest. The study was conducted in 19 Southern provinces, from January to June 2020. 647 Swiftlet's houses were randomly selected. Surveyed indicators were included in the questionnaire and were recorded at farm. Results reveal that average temperature was 28.5°C (22-31°C), didn't affect to the nest yield; Average humidity was 81.70% (68-91%), bird's nest yield was the highest in the swiftlet house with humidity ranged from 79- 84%; Average sound

intensity level inside the swiftlet's house was 71.7dB, did not affect to the nest yield, however the nest yield tended to highest when the sound intensity was from 70-74 dB; Average light intensity was 0.24Lux, did not affect to the nest yield, but light intensity of 0.18-0.26Lux tended to give the highest nest yield. In general, the bird's nest yield reached highest (125 to 140 g/m^2/year) when average temperature, humidity, light and sound intensity level inside the swiftlet's house were 27.94 - 28.95°C; 81.26 - 84.83%; 0.18 - 0.20 Lux and 75.01 - 79.96 dB respectively.

Keywords*: temperature, humidity, light, sound insensity level, Bird's nest yield, swiftlet's house.*

PRODUCTION CAPACITY OF SIN CHENG DUCK IN TWO DIFFERENT RAISING METHODS

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The objective of this study was to assess reoductivity of Sin Cheng duck rearing in the semi – intensive and intensive production systems. A total of 1-day-age 360 ducklings were divided equally into each production system with 3 repetitation. Results show that the weight of male at 22 weeks of age was 2235.30 g and 2329.68 g in the semi – intensive system and intensive production system, respectively, and that of female was 2227.19 g and 2340.81 g. Egg performance/hen/44 weeks of age was 91.80 eggs và 88.07 eggs in the semi – intensive system and intensive production system, respectively. Feed consumption/10 eggs was 3.94 kg and 4.26 kg in the semi – intensive system and intensive production system, respectively. The average embryo percentage was from 95.16% to 95.44%, the hatchability/embryo percentage was from 89.77% to 89.94%. The average egg weight was from 75.31 g to 75.66 g/egg, Haugh unit of egg in the in the semi – intensive system and intensive production system is 81.25 and 80.20%, respectively. Protein, lipit and overal mineral are, respectively, 17.75%, 31.80% and 2.21% in the in the semi – intensive system 17.72%, 31.72% và 1.81% in the intensive production system.

Keywords: *Sin Cheng duck, duck Productivity, duck egg quality*

RESEARCH ON SUITABLE RAISING METHODS FOR "SEN" MUSCOVY DUCK OF REPRODUCTION

Vol 122. April, 2021. Pp. 76-88

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A random factor experiment (raising menthod) was conducted on 1,800 "Sen" muscovy ducks for breeding and was conducted at Dai Xuyen Duck Breeding and Research Center, experimental 1 (completely kept in house), experimental group 2 (kept in house and raising in garden). Starting from 1 day of age, experimental muscovy ducks were wearing the number of wings each, there were two experimental: experimental 1 (completely kept in house) reached 92.89%, experimental group 2 (kept in house and raising in garden). Arranged in the stages of duckling (0 - 8 weeks of age) - prepare laying - laying. The results show that: The survival rate in the stages of duckling and prepare laying (0 - 26 weeks of age), the survival rate achieved from experimental 1 (completely kept in house) reached 92.89%, experimental group 2 (kept in house and raising in garden) reached 91.22%, the body weight of Sen muscovy duck at 26 weeks of age reached in experiment 1 was 3120.50g/male, 2011.67g/female; the weight of experiment 2 was 3052.78 g/male and 1976.17 g/female. At 29 weeks of age, laying rate in 52 weeks was the highest in treatment 1 (kept in house) 24.32%, treatment 2 (kept in house and raising in garden) 23.95%;egg production was 88.54 and 87.18 eggs/female/52 weeks of laying; feed consumption/10 eggs were 6.89 and 6.91 kg respectively, the embryo rate in experiment 1 reached 94.78% and the rate of embryos in experiment 2 reached 94.66%. Percentage of hatched/total eggs with embryos was highest in treatment 1 was 85.58% and treatment 2 reached 85.79%. The ratio of type I duckling / number of ducklings hatched in treatment 1 was 94.80% high and 94.46% in treatment 2. Economic efficiency was 176,642,389 VND, interest /female 392,539 VND, mixed income index (MI), profit (Pr), mixed income / total cost and mixed income / laborreaching the highest level in the experimental lot 1 with the corresponding indices of 239,642,389 VND; 203,642,389 VND; 0.59 and 6.66. Sen muscovy duck completely kept in house.

Keywords: *Raising methods, Sen muscovy duck, reproduciton, economic efficiency*.

SOME MANNERS OF CULLING IN DAIRY FARMING

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Culling is an inevitable activity in dairy industry, it is not only a high-cost operation in dairy farms, but also partial and indispensable importance of management and maintenance of herd's scale and performance. In practice, many terms are used to describe culling, and many indices are also used, all of them leading to the 'Herd turnover rate'. The methods to estimates these indices vary not only between indices, but even the same index. Currently, readers or users must be wary when interpreting values or comparing them with other herd indicators or studies.

Determining an appropriate culling rate is often difficult, there is no optimal culling index appropriate for all herds or for all the years. Culling rate is the net revenue of a series of culling decisions made on a day-to-day basis for each individual. These decisions are derived from economic considerations (milk price, waste price, replacement cost, etc.).

Categorizations of culling of dairy cows should be in accordance with the preferred approach, classification under the economic and biological culling are reasonable approaches. In order to increase economic efficiency in dairy farming, it is necessary to reduce the rate of biological culling rate in the way that improves the breeding, management and surrounding environment, while applying well the economic culling rate. Optimal culling rates for the whole country and for dairy herds shoud be varied from 25% to 35%.

Keywords: *Dairy cows, culling, rate, herd's turnover.*

APPEARANCE CHARACTERISTIC AND PRODUCTION ABILITY OF TRAU MUSCOVY DUCKS

Vol 123. May, 2021. Pp. 13-21

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The study was conducted at Thuy Phuong Poultry Research Station from 2019 to 2020. The topic commonly used conventional research methods in poultry production, aims to initially evaluate appearance characteristics, production capacity of Trau muscovy. The result showed that the (appearance characteristics at 01 day of age with black feathers, with 04 yellow dots on their backs, yellow necks, yellow bellies, black beaks, lead legs with black stripes running along the the leaf veins toes. Adult muscovy ducks have jet-black feathers, with 2 or without 2 white spots on wings, neck and abdomen black feathers arranged in fish scales, gray beaks with black lead legs with black stripes running along the toes in leaf veins, quick eyes, bright red crests. Their body weight at 8 weeks old male muscovy ducks reached 2030.78 g. Egg yield/a hen/a year reached 85.39 eggs; food consumption/10 eggs 7.15 kg. The percentage of eggs with embryos reached 95.45%.

Keywords: *Trau muscovy duck, production ability, Domestic muscovy duck*

THE PRODUCTIVITY OF LANDRACE BOAR RAISED IN BAC GIANG BREED JOINT STOCK COMPANY

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The study aimed to evaluate the productivity of Landrace boar in Bac Giang breed joint stock company. Sixty nine Landrace boars were collectted semen to assess the quality parameters and then inseminated for 60 sows

F1(Landrace × Yorkshire). The semen of boars were extracted and stored by TH4 medium in 24h, then the semen was diluted and examined the quality parameters by Ceros II system.The results indicated that, breeding factors have a significant effect on the parameters such as progressive percent of sperm, slow sperm percent ($P<0.001$), motile sperm percent of total, number of doses of sperm/times of collection of semen ($P<0.01$), but not significant effect on sperm quantity and total concentration of sperm ($P>0.05$). The old-age of boar has a significant effect on sperm quantity ($P<0.01$), most evidently in progressive percent of sperm and number of doses of sperm/times of collection of semen ($P<0.001$), but not significant effect on total concentration of sperm, motile sperm percent and slow sperm percent ($P>0.05$). The seasons have not a significant effect on slow sperm percent ($P>0.05$), but significant evidently on the parameters such as sperm quantity, progressive sperm percent of total and number of doses of sperm/times of collection of semen ($P<0.001$), total concentration of sperm, motile sperm percent ($P<0.01$). All the parameters of sperm showed highest in spring, lowest in autumn. The time of sperm collection has a significant effect on motile sperm percent of total ($P<0.05$), but not significant effect on the remaining parameters ($P>0.05$), when extracting in the evening with cool weather, motile sperm percent show higher as compare to the morning. The parameters of semen quanlity of Landrace boars reach the requirements of TCVN 9111:2011 for foreign boar standards. The conception rate of sows F1 generation (Landrace × Yorkshire) were 93.33% when fertilised by artificial insemenation of Landrace boar, this is high rate as compare with the standards.

Keywords: *Bac Giang, boar, Landrace, sperm*

PRODUCTIVITY OF THE CROSSBRED BETWEEN LT_1 AND LT_2 CHICKEN LINES

Vol 123. May, 2021. Pp. 33-40

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The study evaluates the productionability of LT_{12} crossbreds between 2 lines (Cockline LT_1 and henline LT_2) aiming tore-evaluate the results of and the breed selection in creating 2 lines, and at the same time to determine the hybrid heterosis and yield indicators of the hybrid offspring. The study was carried out at Domestic Animal Experiments and Conservation Center. The experiment was arranged according to the method of plotting a completely randomized comparison with one factor: 50 birds/lot, with 3 times repeated. The results showed that LT_{12} crossbred chickens had a high survival rate of 95.33%. Bodyweight at 16 weeks of age of LT_{12} chicken was 1690.14 g. The heterosis of the hybrid in body weight over the average of parents was 4.12%. The FCR of LT_{12} crossbred chicken was 3.61 kg, hybrid heterosis was -3.09%.

Keywords: *Bodyweight, feed consumption*

SELECTION FOR IMPROVING GROWTH PERFORMANCEOF DUROC, LANDRACE AND YORKSHIRE PURBREDS AT DABACO NUCLEAR PIG BREEDING COMPANY

Vol 123. May, 2021. Pp. 41-52

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The study was conducted from 2015 to 2021 to selection for improving the growth performance of Duroc, Landrace and Yorkshire purebreds at Dabaco Nuclear Pig Breeding Company. Based onestimated genetic parameters and EBV, the selection process was carried out through three stages. During first stage, 5% of testing performance boars were selected as sires, in the next stage 5% of their offspring were retained as sires. Selection efficiency was assessed by phenotypic value and genetic trend through the selection stages. The results showed that: The heritabilities of Duroc, Landrace and Yorkshire were: 0.53 - 0.56; 0.33 - 0.39 and 0.40 - 0.43 for ADG, respectively and 0.55 - 0.60; 0.51 - 0.52 and 0.39 - 0.57 for lean meat percentage, respectively. Genetic correlation coefficients between these two traits were generally low and their errors at high levels. The boar selection of Duroc, Landrace and Yorkshire for ADG with a rate of 5% according to their EBV increased the annual ADG: 6.97, 8.26 and 21.5 g/day, respectively and the annual genetic trend: 4.71, 13.31 and 16.79 g/day, respectively. Breeding based on EBV was an effective measure to improve the growth performance of purebred pig breeds raised at Dabaco Nuclear Pig Breeding Company.

Keywords: *Pig breeding, ADG, EBV, genetic parameter*

SELECTION TO IMPROVE NUMBER OF PIGLETS BORN ALIVE OF PURE LANDRACE AND PURE YORKSHIRE SOWS AT DABACO NUCLEAR PIG BREEDING COMPANY

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The study was implementedfrom 2015 to 2021 on selection to improv the reproduction performance of purebred Landrace and Yorkshire sows at Dabaco Nuclear Pig Breeding Company. Based on the estimated genetic parameters of number of piglets born alive (NBA), the repeatability model was used to predict EBV of NBA. Selection of sows was executed through two stages, in each stage 40% of the sows with the highest EBV were selected and evaluated at the later stage. The results showed that: The heritability of total piglets born (TB), NBA and number of piglets weaned (NW) were: 0.12 - 0.13; 0.10 - 0.11 and 0.03 - 0.09, respectively for Landrace; 0.11 - 0.13; 0.11 - 0.13 and 0.07, respectively for Yorkshire. In comparison with stage 1, TB and NBA increased to 0.61 ($P<0.0001$) and 0.54 ($P<0.05$) piglets, respectively for Landrace, 0.41 ($P<0.0001$) and 0.33 ($P<0.05$), respectively for Yorkshire. Selection based on EBV of NBA with a rate of 40% created a genetic trend for NBA at level of 0.06 piglets/litter/year for Landrace and 0.013 piglets/litter/year for Yorkshire.

Keywords: *NBA, EBV, Landrace, Yorkshire.*

EFFECTS OF PINEAPPLE BY-PRODUCT ON NUTRIENT COMPOSITION, DIGESTION AND DIET EFFICIENT OF FERMENTED TOTAL MIXED RATIO IN GOATS

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This study aim to evaluate the effects of utlization pineapple by-product (PBP) replacing with 10% dry matter of fresh corn plant on nutrient composition, preservation, nutrient digestibility and nutrient efficiency of fermented total mixed ratio (FTMR) in the goats. The results show that, replacing 10% dry matter of fresh corn plant with PBP did not affect on nutrient composition during fermentation. pH of the FTMR was lower for the PBP diet comparing to the control diet. The mold appearance was later for the PBP diet compare to the control diet. The replacing PBP with corn plant did not affect on the DM and OM intake and digestibility, but it resulted in the higher protein digestibility in the goat comparing with those of the control diet. The PBP diet did not affect the rumen fermentation of the goats. The average daily gain of goat fed PBP FTMR was higher than that of goat fed control diet. In conclusion, replacing PBP with 10% corn plant in the FTMR did not affect on the nutrient composition, but prolong preservation time, increasing digestibility and feed efficiency on goats.

Keywords: *pineapple by-product, fermented, total mixed ratio (TMR), preservation, goats*

DETERMINATION OF THE OPTIMAL METABOLIZABLE ENERGY AND STANDARDIZED ILEAL DIGESTIBLE AMINO ACIDS FOR PS GESTATING SOWS

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The experiment was conducted to estimate the optimal level of metabolizable energy (ME) and standardized ileal digestible lysine (SID Lys) for sows during gestation. A total of 90 PS gestating sows (Landrace × Yorkshire and Yorkshire × Landrace) were used in two-factorial experimental design. The first factor is ME (three levels: 2,900; 3,000 and 3,100 kcal/kg) and the second is SID Lys (three levels: 0.50; 0.60; 0.70%) for 9 treatments in 10 replications with one sow per replicate for each

treatment. The experiment was carried out at Thong Nhat farm, Cu Chi district, Ho Chi Minh City from March to August in 2019. The results showed that ME at 3,000 kcal/kg, 0.60 and 0.70% SID Lys in diet were likely to be a right level for PS gestating sows in early and late pregnancy, respectively.

Keywords*: ME, PS gestating sows, SID Lys*

BENEFITS OF CONDENSED TANNINS IN FORAGE LEGUMES FED TO RUMINANTS

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Tannin (tannic acid) belongs to the group of polyphenols, is a compound with a complex structure and is divided into 2 groups of hydrolyzed tannins and concentrated tannins (CT). Tannins (polyphenols) are present in most plants and are abundant in coffee, tea, grapes, licorice, berries, chestnuts, legumes, etc. Depending on the plant source, the composition and structure of tannins are also different very big difference. Beneficial animal responses to tannin concentrates when concentrations are consistent are improved growth, milk production, fertility, and reduced methane emissions and ammonia volatilization from feces or urine. Most important is the forage's ability to resist the effects of parasitic roundworms in the digestive tract. Animal responses were variable to tannin concentrates, which were initially attributed to dietary CT concentrations, but recent research has highlighted the importance of their molecular structure, as well as their concentrations, and also composition of diets containing concentrated tannins. The importance of CT structural features cannot be underestimated. Interdisciplinary research is key to elucidating the relationship between CT characteristics and biological activities and will allow for better exploitation of these natural plant compounds in livestock farms. Research is also needed to provide plant breeders with guidance and as a screening tool to optimize CT traits in forage and livestock diets. In addition, there is a need to improve the competitiveness and agronomic profile of legume-containing tannin concentrates and the understanding of options for inclusion in ruminant diets. This review includes recent results from the multidisciplinary study of sainfoin (*Onobrychis* Mill. Spp.) and provides an overview of current developments with several forages, particularly especially legumes.

Keywords: *Concentrated tannins, legumes,feed, ruminants.*

GROWTH PERFORMANCE OF THREE GROUPS OF F_1 CROSSBREDS BETWEEN BRAHMAN, DROUGHTMASTER AND RED ANGUS WITH LAI SIND COWS IN BEN TRE PROVINCE

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The experiment was carried out to evaluate the growth performance of three groups of F_1 crossbreds between Brahman, Droughtmaster and Red Angus with Lai Sind cows under breeding conditions in Ben Tre province. Each crossbred group has 30 F_1 heads, of which F_1 Brahman includes 11 males and 19 females, F_1 Droughtmaster includes 11 males and 19 females, F_1 Red Angus includes 13 males and 17 females. The study period included the growth period from birth to 18^{th} month of age and the fattening period from 18^{th} to 21^{st} month of age. The results showed that the body weight of the F_1 Red Angus and F_1 Droughtmaster crossbreds was higher than that of the F_1 Brahman ($P<0.05$) at the time from birth to 18^{th} month of age. At 18^{th} month of age, the body weight of the F_1 Red Angus was the highest (410.43 kg), followed by the F_1 Droughtmaster (395.63 kg) and the lowest was the F_1 Brahman (345.53 kg). There was no difference in body weight between the F_1 Red Angus and F_1 Droughtmaster during the growing period ($P>0.05$). Daily weight gain of the crossbred groups was similar from birth to 6^{th} month of age ($P>0.05$). However, from 6^{th} to 18^{th} month of age, the daily weight gain of the F_1 Red Angus and F_1 Droughtmaster was higher than that of the F_1 Brahman ($P<0.05$). When calculated over the entire period from birth to 18^{th} month of age, the daily weight gain was 595.5; 678.5 and 705.9 g/head/day in F_1 Brahman, Red Angus and Droughtmaster, respectively. During the fattening period, the

daily weight gain of the treatments was similar, ranging from 1,047 - 1,108 g/head/day. The economic efficiency of fattening reaches from 3.2 to 4.6 million/head and the F_1 Red Angus crossbred has the highest economic efficiency, followed by F_1 Droughtmaster and finally F_1 Brahman. Through the study, it can be concluded that the Red Angus and Droughtmaster crossbreds have good growth potential in the farming conditions of farmers in Ben Tre.

Keywords: *F_1 crossbred cattle, fattening, growth, weight gain*

EFFECTS OF PROBIOTIC AND BUTYRIC ACID SUPPLEMENTATION IN THE DIETS ON PERFORMANCE AND *E.COLI* IN FECES OF GROWING GRIMAUD DUCK

Vol 124. June, 2021. Pp. 24-33

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An experiment (Exp) was conducted to determine the effects of probiotic and butyric acid products supplementation in diets on growth performance and *E.coli* in feces of Grimaud ducks. The experiment was conducted in a completely randomize design with 3 treatments and 3 replications with 20 ducks/pen (10 male + 10 female). The treatments were: 1/ ĐC: Basal diet (BD) without any product supplementations; 2/ PRO: BD + 1.0 g probiotic /kg feed; 3/ ABU: BD + 1 g butyric acid /kg feed. Results showed that the average daily gain (TKL) of ducks fed ĐC (64.25 g/head/day) was lowest, and the highest was found in PRO (66.57 g/head/day) and ABU (65.32 g/head/day). Average daily feed intake (TTTA) was almost similar in supplemented diets to compare with control diet. Therefore, feed conversion ratio (FCR) of ducks fed PRO (2.02 kg feed/kg gain) was better than that in ĐC (2.05 kg feed)/kg gain) and ABU (2.07 kg feed/kg gain). The density of *E.coli* bacteria in feces reduced in ABU (2.03 and 2.55 × 10^6 CFU /g feces) compared to PRO (2.31 and 2.72 × 10^6 CFU /g feces) and ĐC (3.51 and 3.89 × 10^6 CFU /g feces) at 21 and 42 days, respectively. There was no difference in the slaughter parameters such as carcass percentage, thigh and breast meat percentage among ducks in 3 treatments.In conclusion, supplementation of probiotic or butyric acid in Grimaud duck diets tended to improve weight gain and reduce *E.coli* density in the feces, but not with feed conversion ratio compared with control diet.

Keywords: *Probiotic, acid butyric, E.coli, Grimaud duck.*

EVALUATION SOME PARAMETERS IN SOWS AND IMMUNITY AGAINST FOOT AND MOUTH DISEASE IN PIGLETS FOLLOWING B-GLUCAN AND VITAMINS SUPPLEMENT IN DIETS IN CHAU THANH DISTRICT OF BEN TRE PROVINCE

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The study was carried out at the Pig Farm of the center of High-Tech application in Agriculture Ben Tre, Phuoc Thanh hamlet, Tam Phuoc commune, Chau Thanh district, Ben Tre province, from June 2020 to June 2021.The aim was to propose solutions to increase resistance in the prevention of diseases in breeding pigs. The pigs were assigned into 3 treatments in a completely randomized design: control treatment (DC), adding premix vitamin treatment (VIT), adding β-glucan treatment (BETA) and 15 replications. The results indicated that sows in VIT treatment were earlier on estrus, and the first insemination was the highest (73.3%), the next BETA (66.7%) and DC (60%). The average gestation time of experimental sows was 113.8-114.8 days; the number born alive was 9.67-10.87 piglets/litter and the number of weaned pigs was 9.40-10.53 piglets/litter (P>0.05). Individual birth weight was 1.40-1.43 kg/piglet and weaning weight was 6.96-7.43 kg/piglet of 03 treatments that were similar. The analyzed results of sera samples to detection of antibodies against Foot-and-mouth disease virus type O by competitive ELISA technique showed that: after injecting the Foot-and-mouth vaccine, the concentration of antibodies against Foot-and-mouth disease virus was high at the point time of sows birth their piglets via the OD

index in the treatments. Piglets at 7 old days in 3 treatments were responded with antibody again Foot-and-mouth disease virus and significantly decreased in piglets at 21 old days.

Keywords: *snow and piglet, β-glucan, premix vitamin, antibody, Ben Tre province*

STUDY ON FEED FORMULATION USING LOCALLY AVAILABLE FEED INGREDIENTS FOR HOA LAN DUCKS

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The experiment was conducted in a duck household in long an province from 7/2019-12/2020 to study on feed formulation using local available ingredients for Hoa Lan ducks. 2400 one-old ducklings (480 males and 1920 females) were arranged according to the completely randomized design (CRD) with 4 different diets in term of the rate of replacing commercial feed (TAHH) with the feed formulating using local available ingredients (0%, 35%, 70% and 100%), 3 replicates. Results reveal that replacing commercial feed with the feed formulating using local available ingredients up to 100% didn't effect to survival rate, body weight, egg yield and hatching ability of ducks, egg production/hen/52 weeks of laying, feed consumption per 10 eggs in all treatment ranged from 219.5-220.7 egg and from 3.11-3.18 kg respectively. However, these replacing reduced up to 22.0% feed cost.

Keywords: *body weight, diet, egg yield, fcr/10 eggs, growth, Hoa Lan ducks*

CHEMICAL COMPOSITION ANALYSIS RESULTS ON SOME OF PROTEIN RICH METERIALS FOR ANIMAL FEED PRODUCTION FROM 2006 TO 2020

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Reference database for researchers on nutrition, animal feed rations and teaching, supplementing the chemical composition table when re-publishing the book; 'Composition and nutritional value of animal and poultry feed in Vietnam"; The data is statistically and processed for a period of 15 years from 2006 to 2020 at the Department of animal feed and products analysis. Analytical methods are livestock industry standards (TCN), Vietnamese standards (TCVN), are prescribed for chemical composition determination including dry matter, moisture, crude protein, real protein, crude fat, fiber raw materials, raw ash, calcium, phosphorus, NaCl, NH3, urea and sand... in materials and animal feed. The results obtained from 5 sources of high-protein materials show that:Fishmeal: the period from 2006 to 2020, the chemical composition had an increase; dry matter was 90.68% compared 83.49%; crude protein was 64.85% compared 55.79%; crude fat was 9.92% compared 5.58% and decreased: crude ash was 21.60% compared 31.67%; calcium was 5.96% compared 6.92% published in 2001. Soybean meal: crude protein, crude ash, phosphorus and crude fiber did not have a significant change inf the mean value the 2001 publication compared with the period from 2006 to 2020, only the crude fat and calcium are more diffrent. Dried rapeseed: The small number of samples (published in 2001, 02 samples; 05 samples in the period 2006 to 2020), so it did not reflect the true value. Dried peanut: Crude protein and crude fat parameters have the difference of the mean value between the published in 2001 and the period 2006 to 2020 due to the limited number of samples, therefore, the data are not representative. Meat and bone meal: There was no difference from the 2001 compared with the period from 2006 to 2020 was dry matter; the crude protein, crude fat, crude ash, calcium and phosphorus were present insignificant difference of the publication in 2001 compared to the period 2006 to 2020 may be due to the limited number of samples, moreover that is also reflected, through standard deviation is high from 3.01 to 8.74 of the period 2006 to 2020 and from 3.67 to 6.51 of the published 2001. The difference in some chemical components of materials is fishmeal, only raised one problem is that modern and advanced fishing and processing technology has increased the quality of materials for animal feed production.

Keywords: *Statistics, data processing, chemical components, animal feed*

ASSESSMENT OF THE PRACTICE FOR BIOSECURITY SOLUTIONS ON PIG FARMING HOUSEHOLD IN VIETNAM

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Using the survey direct data collection method and the participatory rural appraisal (PRA) with the questionnaires to assess the biosecurity situation of pig farming households in Vietnam. Survey 112 farms with open house (less than 10 livestock units) in 08 provinces such as Hanoi, Thai Binh, Bac Giang, Nghe An, Binh Dinh, Dak Lak, Dong Nai and Ben Tre during the period from November 2019 to November 2020. The results showed that: the pigsty location is close to crowded places, main roads, surface water sources; the pig house not have a quarantine area for sick pigs, lack ancillary areas and have not yet ensured condition of biosecurity; there are not clear origin and not quarantine records for purchase of breeding pigs, piglets and semen, and there are the domestic animals (chicken, duck, cattle, buffalo, goat, fish) for sales in the breeding area; nursery and breed of pigs which not implement "all in - all out" solution and lack farm-specific material, protective gear, equipment and vehicles; many farmers using the leftover food, the agricultural by product that not complete the nutrition diets for pigs, and they have not yet paid attention to the drinking water quality and washing water used in pig production; cleaning and disinfection has not yet be thorough; waste treatment and environmental protection are still not good, many households is spilled liquid waste out, and solid waste is rarely treated by heating method or chemical or bioproducts, the person manipulating the cadavers rarely use disposable gloves; disease prevention is not good, the sick pigs are not kept in quarantine areas.

Keywords: *Biosecurity, pig farming household*