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台灣杜洛克級進公豬精液性狀分析

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台灣杜洛克級進公豬精液性狀分析

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受精率對養豬產業競增能力影響甚鉅，精液性能檢定技術的發展有助提升母豬受精成功機率。本試驗目的旨在觀察台灣杜洛克級進公豬之精液性能表現。試驗利用精子計數器與流式細胞儀觀察R1代（杜洛克母豬 × 高畜黑公豬；N = 4）與R2代公豬（杜洛克母豬 × R1代公豬；N = 4）之精子體能，包括精液量、精子濃度、總精子數、粒線體膜去極化及精子活力，每頭平均檢測次數2 ~ 4次。試驗觀察R1與R2代公豬在平均檢測日齡分別為604.38 ± 53.12與578.93 ± 57.81（天）精液性能的表現。結果顯示，精液量分別為185.63 ± 71.19與244.36 ± 127.69（毫升）；精子濃度分別為3.17 ± 0.90與2.92 ± 1.00 （億/毫升）；總精子數分別為588.66±49.70與713.70±128.22（億）；粒線體膜去極化分別為13.77 ± 5.65與15.94± 10.33（%）；精子活力分別為75.92 ± 18.23與81.84 ± 9.64（%）。綜合結果得知，R2代公豬精液性能表現較R1代公豬為佳，顯示台灣杜洛克公豬經級進育種後，精液性能已明顯提升，後續仍有待評估。

關鍵語：台灣杜洛克、公豬、精液

ANALYSIS OF SEMEN PERFORMANCE IN TAIWAN DUROC BOARS FOLLOWED BY UPGRADING BREEDING

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Fertility can seriously affect the competitiveness of pig industry. Development of semen quality evaluation is helpful for sow’s fertility. The purpose of this study was to evaluate the semen quality of Taiwan Duroc boars followed by upgrading breeding. We used the sperm counter and flow cytometry to observe semen quality, including semen volume, sperm concentration, total sperm count, mitopotentia and sperm motility, of R1 (Duroc sow × KHAPS black boar, N = 4) and R2 boar (Duroc sow × R1 boar, N = 4). Semen quality evaluation was performed for 2 to 4 times per boar. The average evaluated-day-old of R1 and R2 boars were 604.38 ± 53.12 and 578.93 ± 57.81 day, respectively. The semen volume, sperm concentration, total sperm count, mitopotentia and sperm motility were 185.63 ± 71.19 (mL), 3.17 ± 0.90 (108 / mL) , 588.66 ± 49.70 (109), 13.77 ± 5.65 (%) and 75.92 ± 18.23 (%) in R1 boars; and 244.36 ± 127.69 (mL), 2.92 ± 1.00 (108 / mL), 713.70 ± 128.22 (109), 15.94 ± 10.33 (%) and 81.84 ± 9.64 (%) in R2 boars, respectively. The results showed that semen performance of the Taiwan Duroc boar were obviously increased after upgrading bleeding and were needed to evaluate in the future

programs.

Key words: Taiwan Duroc, Boar, Semen

台灣杜洛克豬級進世代之生長性狀

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本試驗旨在調查台灣杜洛克豬級進育種後裔之生長性狀。參試豬隻包括R1公豬（D 50% × K 50%）58頭、R2（D 75% × K 25%,）公豬35頭與R3代（D 87.5% × K 12.5%）公豬40頭、母豬35頭。生長性狀包括70日齡體重、150日齡重、日增重、背脂厚度及飼料效率。結果顯示R1、 R2、R3代公豬及R3代母豬之70日齡體重（平均 ± 標準偏差）分別為30.8 ± 3.8、29.7 ± 3.8、29.9 ± 3.4及30.4 ± 3.4公斤；150日齡重分別為94.1 ± 9.7、95.0 ± 13.3、95.6 ± 10.6及86.1 ± 7.6公斤；日增重則分別為0.80 ± 0.11、0.82 ± 0.15、0.83 ± 0.12及0.71 ± 0.09公斤；飼料效率分別為2.65 ± 0.26、2.66 ± 0.36、2.63 ± 0.40及2.83 ± 0.37；三點平均背脂厚度分別為1.96 ± 0.21、2.02 ± 0.22、2.12 ± 0.16及2.06 ± 0.18公分。綜合R1至R3代公豬之生長表現，皆無顯著差異，故下一世代將以公豬完檢體重達到110公斤以上，母豬90公斤以上作為選留標準。

關鍵語：台灣杜洛克、級進育種、性能

THE GROWTH PERFORMANCE OF TAIWAN DUROC HYBRIDS FOLLOWED BY UPGRADING BREEDING

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The purpose of this study was to investigate the performance of the Duroc hybrids in upgrading breeding programs. In this study, we used 58♂ R1 (D 50% × K 50%) , R2 35♂(D 75% × K 25%,) and R3 (D 87.5% × K 12.5%) 40♂, 35♀. we collected The body weight at 70 days old (BW70), The body weight at 150 days old (BW150), average daily gain from 70 days to 150 days (ADG), feed efficiency (FE) and backfat thickness (BF) as growth performance. Our results were the BW70 (mean ± SD), BW150, ADG, FE and BF of R1 male, R2 male, R3 male and R3 female were 30.81 ± 3.18, 29.66 ± 3.82, 29.90 ± 3.38 and 30.35 ± 3.37 kg, 94.07 ± 9.69, 95.01 ± 13.26, 95.58 ± 10.60 and 86.10 ± 7.64 kg, 0.80 ± 0.11, 0.82 ± 0.15, 0.83 ± 0.12 and 0.71 ± 0.09 kg, 1.96 ± 0.21, 2.02 ± 0.22, 2.12 ± 0.16 and 2.06 ± 0.18 cm, respectively. The preliminary results showed that there were no significant difference among the growth performances of R1, R2 and R3. Therefore the male and female hybrids in the next-generation of upgrading programs with BW150 more than 110 and 90 kg, respectively could be further selection.

Key Words: Taiwan Duroc, Upgrading breeding, Performance

乳牛群單日乳產量高於55公斤之月齡與乳質研究

乳牛群單日乳產量高於55公斤之月齡與乳質研究

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應用DHI資訊把單日乳產量高於55 kg的高乳量牛，檢視其乳質性狀，作為乳量乳質兼顧的選拔依據。因此，本研究自2001年1月至2011年10月間DHI資料庫www.angrin.tlri.gov.tw選取單日乳產量高於55 kg之乳樣記錄，進行產乳月齡及其乳質研究。至2011年10月，單日乳量記錄最高為72.2 kg，高於55 kg有511名，單日乳產量平均 57.9+3.0kg，乳牛檢測月齡平均為64.3+19.2月齡，產乳月齡範圍為24~157月齡。產乳月齡60月齡以內，有45%(234/511)。單日乳產量高於55 kg的511名之乳脂肪率(F)、蛋白質率(P)、乳糖率、體細胞數、尿素氮、枸櫞酸、以及P/F比值之平均+標準偏差分別有3.17+0.81%、2.89+0.25%、4.79+0.26%、17.7+39.6萬細胞/mL、12.3+5.3mg/dL、187+27mg/dL、以及0.96+0.26。當與2010年台灣乳牛168,913乳樣之乳脂肪率(3.74%)、蛋白質率(3.30%)、P/F比(0.91)、乳糖率(4.77%)及體細胞數平均33.3萬細胞/mL來比較，單日乳量高於55kg等乳樣之乳脂肪率及蛋白質率明顯地較低，不過單日乳量高於55kg等乳樣之乳質有關的體細胞數平均較2010年台灣乳牛體細胞數平均也較低，顯示高乳量僅降低脂肪率及蛋白質率。因此，台灣乳牛育種策略上，可以乳量、乳質及繁殖性狀兼顧的選拔方向，來培育具有適應濕熱環境特色的台灣乳牛。

關鍵語：乳牛、選育、乳質

DAIRY COWS HAVING GREATER THAN 55 KG OF DAILY MILK YIELD ASSOCIATED TO MONTH OF AGE AND MILK QUALITY

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Breeding scheme of dairy cattle, selection on milk yield and quality associated with reproductive performance is essential to the hot and humid weather, and therefore selected cows will become a heat-tolerance line in Taiwan. Data were used to study the top records on daily milk yield having greater than 55 kg and their age and milk quality from January of 2001 to October of 2011 based upon www.angrin.tlri.gov.tw. The highest record of 72.2 kg on daily milk yield was recorded and there were a total of 511 records having greater than 55 kg on daily milk yield, and with a mean of 57.9+3.0kg. A mean of milking age was 64.3+19.2 months old with ranging between 24 and 157 months of age. There was 45% (234/511) of those cows having highest daily milk yield within 60 months of age. For those of Top 511 cows in daily milk yield, their milk fat (F), protein (P), lactose, somatic cell counts, urea nitrogen, citric acid and P/F ratio were 3.17+0.81%, 2.89+0.25%, 4.79+0.26%, 17.7+39.6 x103/mL, 12.3+5.3mg/dL, 187+27mg/dL, and 0.96+0.26,

respectively, as comparison to the average of 168,913 milk samples with 3.74% fat, 3.30% protein, 0.91 of P/F ratio, 4.77% lactose and 333x103/mL cell counts in 2010. It indicated that the top 511 cows had a significantly less fat%, protein%, and somatic cell counts. It indicated that high yield resulted in a less fat and protein percentage. In conclusion, selection on both milk yield and quality trait in those of cows having greater than 55 kg on daily milk yield would be feasible along with improvement on quality traits including of milk fat, protein, lactose and somatic cell counts under a breeding scheme for dairy cattle in Taiwan.

Key Words: Dairy cattle, Selection, Milk quality

保種華鵝基因多樣性分析

保種華鵝基因多樣性分析

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本研究之目的在於利用微衛星型遺傳標記探討保種褐色與白色華鵝之基因多樣性。以10組微衛星型遺傳標記分析畜產試驗所彰化種畜繁殖場106隻褐色華鵝與118隻白色華鵝之基因多樣性，其交替基因數、觀測異質度(Ho)、期望異質度(He)及多態性訊息量(PIC)範圍分別為1－6 vs. 2－5、0－0.642 vs. 0－0.712、0－0.663 vs. 0.014－0.683及0－0.598 vs. 0.014－0.625，而其平均值則分別為3.0 vs. 3.5、0.332 vs. 0.237、0.401 vs. 0.331及0.342 vs. 0.291，可得知此群華鵝的基因多樣性亦僅具中度多態性資訊。由本研究所得之基因多樣性分析參數，將可提供當作未來保種族群繁衍管理之參考依據。

關鍵詞：保種華鵝、微衛星型遺傳標記、基因多樣性。

GENETIC DIVERSITY OF CONSERVED CHINESE GEESE EVALUATING BY MICROSATELLITE MARKERS

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The objective of this study was to investigate the genetic diversity of the conservative population of Brown and White Chinese geese using microsatellite genotyping. A total of ten microsatellite markers were used to genotype 106 Brown Chinese geese and 118 White Chinese geese of Changhua propagation station, Livestock Research Institute. The values for allele number, observed heterozygosity (Ho), expected heterozygosity (He), and polymorphism information content (PIC) of both lines of geese among all loci were in the range of 1－6 vs. 2－5, 0－0.642 vs. 0－0.712, 0－0.663 vs. 0.014－0.683 and 0－0.598 vs. 0.014－0.625, respectively. The mean values for allele number, Ho, He, and PIC were 3.0 vs. 3.5, 0.332 vs. 0.237, 0.401 vs. 0.331 and 0.342 vs. 0.291, respectively. The result also indicates that the genetic diversities of both Chinese geese populations are moderate. In the future, the parameters of genetic diversity can be referred to the reproduction administration of conservative populations.

Key Words: Conserved Chinese Geese, Microsatellite marker, Genetic diversity.

恆春黑羊粒線體D-loop分析

恆春黑羊粒線體D-loop分析

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本試驗目的旨在利用粒線體D-loop區域序列分析恆春黑羊與其它品種山羊之親緣關係。試驗採集恆春分所之恆春黑羊、黑色波爾、台灣黑山羊恆春品系與民間場之波爾、努比亞山羊共21頭血液樣品並萃取其DNA, 依據山羊mtDNA D-loop區域序列設計專一引子對, 進行山羊血樣DNA之PCR反應, 純化產物後進行序列解析。另外自NCBI基因庫下載現有山羊品種mtDNA D-loop序列, 包括Yudong white、Nanjiang、Qianbei grey、Guizhou white、Lezhi black、Yingshan black、China Boer及Ammotragus Lervia山羊供作外群使用。利用全部mtDNA D-loop區域序列以鄰接法建構山羊演化關係圖, 以瞭解不同山羊品種間之親緣關係。演化樹分析結果將受測羊群分為五群, 第一群包括恆春黑羊、台灣黑山羊恆春品系、黑色波爾山羊與努比亞山羊, 第二群為Yudong white山羊, 第三群為Guizhou white山羊、第四群為Nanjiang及Qianbei grey山羊, 第五群包括China Boer、Lezhi black、Yingshan black與波爾山羊。綜合上述結果得知, 恆春黑羊與台灣黑山羊恆春品系、努比亞及黑色波爾山羊親緣關係甚高。

關鍵語：D-loop、粒線體DNA、山羊

ANALYSIS OF MITOCHONDRIAL DNA D-LOOP REGION IN HENGCHUN BLACK GOATS

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The purpose of this study was to investigate the phylogenetic relationships among Hengchun black goats and other goats using mitochondrial DNA (mtDNA) D-loop sequences. Total DNA was extracted from blood samples of Hengchun black goat, solid black Boer goat, Taiwan black goat, Boer goat, and Nubian goat. The primer pair specific to mtDNA D-loop region of goat was designed and used to amplify 21 goat DNAs. After purification, the PCR products were sequenced by an automatic DNA sequencer. We also downloaded mtDNA D-loop sequences of Yudong white goat, Nanjiang goat, Qianbei grey goat, Guizhou white goat, Lezhi black goat, Yingshan black goat, China Boer goat and Ammotragus Lervia goat (out group) from NCBI GenBank. All the sequences of D-loop region were used to construct phylogenetic trees using Neighbor-joining methods. The results showed that all analyzed goats were divided into five groups using phylogenetic relationship analysis, of which Hengchun black goat, Taiwan black goat, solid black Boer goat and Nubian goat was in the first group; Yudong white goat was in the second group; Guizhou white goat was in the third group; Nanjiang and Qianbei grey goats were in the fourth group; Lezhi black goat, Yingshan black goat, China Boer goat, and Boer goat was in the fifth group. Based on the above results, Hengchun black goat has a phylogenetic indication closely relating to

Taiwan black goat, Nubian goat and solid black Boer goat.

Key Words: D-loop, Goat, Mitochondrial DNA

紅羽土雞選育族群執行雛白痢清除計畫之評估

紅羽土雞選育族群執行雛白痢清除計畫之評估

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雛白痢(Pullorum Disease)是由雛白痢沙門氏桿菌(Salmonella pullorum)所引起的細菌性疾病，主要介蛋與水平傳播，常造成雛雞急性發病死亡，耐過雞群可能成為保菌雞(帶菌者)，種雞場對於此疾病之清除甚為重要，本試驗之目的為協助民間種土雞場建立雛白痢清淨場，期望能使育成率及雞群整齊度提升，進而增加生產效益。試驗紅羽土雞雞群來自進駐本所育成中心之2家種雞場，場內選育族群各世代於15至20周齡時進行翼靜脈採血約1-2mL，進行雛白痢平板凝集試驗，陽性雞隻淘汰不作種用。檢測結果A場陽性率G0及G3至G7世代分別為18.79、7.66、63.50、9.32、14.29及16.30%；B場陽性率G0至G4世代分別為24.2、7.66、11.30、25.40及26.28%。結果陽性率未隨著世代的清除而下降，推測A場G4代所使用檢測試劑疑似過期，A場G6及B場G3時更換試劑品牌，B場G4時搬遷飼養地點，推測因試劑效力、血清型不同、飼養管理及環境變動，造成本試驗陽性率有較高之趨勢。

關鍵語：紅羽土雞、雛白痢

EVALUATION OF POLLORUM DISEASE ELIMINATION IN RED FEATHER NATIVE CHICKEN BREEDING FLOCKS

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Pullorum disease is caused by Salmonella Pullorum and mainly spreaded by horizontal transmission or infected eggs. Acute outbreaks occur in farms quit often, and the affected chicks becomes no symptomatic carrier and infects the chicks via eggs. Therefore, eliminating the pullorum disease remains an important goal in poultry industry. The aim of this study is to control and eradication of Pullorum disease to increase uniformity and efficiency of production of native chicken farms. This study use flocks of native chicken provided by the breeding farm under the program of the Innovation Incubator Center of Livestock Research Institute. Blood samples, 1 to 2 mL, were from wing veins about of 15 to 20 week-old in each generation, and then assayed in rapid whole-blood plate agglutination test. All the positive animals will be culled. The results of the positive rate are 18.79, 7.66, 63.50, 9.32, 14.29, and 16.30% respectively in G0, G3 to G7 of farm A; and are 24.2, 7.66, 11.30, 25.40, and 26.28% respectively in G0 to G4 of farm B. However, positive rate did not decline after culling the positives in generations. This naturally gives rise to the speculation that perhaps the detection reagents expired of farm A in G4, therefore after that the reagents of farm A of G6 and farm B of G3 were changed. Farm B flocks in G4 were removed to the other location. In summary, the differences of antigen doses, serotypes, management, and environment might cause the influence of the higher positive rate of pullorum disease in this study.

Key Words: Red feather native chicken, Pullorum disease

畜試土雞台畜一號近親係數分析

畜試土雞台畜一號近親係數分析

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近親土雞台畜一號原係台灣省畜產試驗所於民國七十四至七十五年間，自全省收集體型小、腳脛細與具單冠等特色之有色羽毛種土雞，經特性純化與選育而成，1997年通過臺灣省政府農林廳動植物新品種命名，本研究分析近親土雞台畜一號L7、L9、L11 及 L12 等四個近親品系，自1986年至2011年的近親係數。計L7有12654隻(♂4318隻、♀8336隻)、L9有13280隻(♂4772隻、♀8508隻)、L11有17034隻(♂5712隻、♀11322隻)與L12有13615隻(♂4962隻、♀8653隻)。四個近親品系自1986年至2006年採用一年一世代全同胞配種方式，1987年L7、L9、L11 及 L12近親係數平均與標準差分別為 0.2376 ±0.0374、0.2320±0.0440、0.2175±0.0550、0.2487±0.0129，2006年升高依序為0.7578±0.0949、0.7088±0.1368、0.6089±0.1275、0.7298±0.0560。從2008年開始為提升產蛋性能，以本族群一年一世代依產蛋性能做選育配種，2008年L7、L9、L11 及 L12近親係數分別為 0.6024±0.1567、0.6122±0.1600、0.4914±0.1584、0.6569±0.1673，至2011年依序為0.5162±0.0093、0.5220 ±0.0191、0.4439±0.0337、0.2422±0.0448，因非全同胞配種L7、L9與L11品系近親係數皆略降低，以L12品系近親係數之降幅較大。

關鍵語：臺灣土雞、近親配種、近親品系

INBREEDING COEFFICIENTS OF TAIHSU NO. 1 COUNTRY CHICKEN

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Taihsu No. 1 is a Single crown and slim shank country chicken, collected from several locations of Taiwan and and purified by 1.5 decades, from1985 to 2011. The inbred Native Chicken, Taihsu No. 1 has four lines, L7, L9, L11 and L12, passed nomination of new plant and animal species of Agriculture and Forestry of Taiwan Provincial Government in 1997. Inbreeding coefficients of this study are of the birds from 1986 to 2011 of four lines, L7, L9, L11 and L12. There are 12,654 total of L7 (♂ 4318 birds, ♀ 8336 birds); L9 has 13280 (♂ 4772 birds, ♀ 8508 birds); L11 has 17034 (♂ 5712 birds, ♀ 11322 birds) and L12 are 13615 (♂ 4962 birds, ♀ 8653 birds). The inbreeding selection was one generation per year by full-sib mating practiced from 1986 t0 2006. Inbreeding coefficients of L7, L9, L11 and L12 at 1987 were 0.2376 ± 0.0374,0.2320 ± 0.0440,0.2175 ± 0.0550 and 0.2487 ± 0.0129, which increased to 0.7578 ± 0.0949, 0.7088 ± 0.1368, 0.6089 ± 0.1275 and 0.7298 ± 0.0560 at 2006 . Breeding strategy was changed to enhance the egg production from 2008 which selection enhanced on egg production performance, full-sib mating ignored. Inbreeding coefficients of L7, L9, L11 and L12 were 0.6024 ± 0.1567,0.6122 ± 0.1600,0.4914 ± 0.1584 and 0.6569 ± 0.1673 at 2008 and decreased to 0.5162 ± 0.0093, 0.5220 ± 0.0191, 0.4439 ± 0.0337 and 0.2422 ± 0.0448 at 2011.Results showed inbreeding of L12 decreased most in four lines, however, L7, L9 and L11 decreased slightly.

Key Words: Taiwanese native chicken, Inbreeding, Inbred line

畜試土雞產蛋數的改進

畜試土雞產蛋數的改進

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為建立高產蛋數選育技術平台，選育高產蛋數土雞品種，進而輔導民間種雞場建立高產蛋數土雞群，提升種雞場種雞產蛋性能。以畜試土雞近親品系台畜一號(L7、L9、L11及L12四個近親品系)進行高產蛋數選育，經4個世代對產蛋數的選育，四個畜試土雞品系的母雞40週齡產蛋數在世代間存在顯著差異(P
關鍵語：雞、產蛋數、選育

IMPROVEMENT OF EGG NUMBER IN LRI-1 NATIVE CHICKEN

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In order to improve egg number for Taiwan country chicken breeding farms, establishing the standard operating procedures is necessary. The platform was demonstrated by inbred selection. Egg number was the only major trait on the illustration selection. High egg number hens were selected for breeding from four lines of Livestock Research Institute (Inbreed Lines, L7, L9, L11 and L12) . After four generations of selection, significant differences of egg number up to 40 weeks of age were detected among the generations(P
Key Words: Chicken, Egg number, Selection

屠宰場廢水處理活性污泥之細菌多樣性分析

屠宰場廢水處理活性污泥之細菌多樣性分析

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本研究之目的在於探討不同齡處理屠宰場廢水活性污泥中之細菌多樣性。使用商業核酸萃取套組直接萃取污泥齡分別為7、14、21及28日之活性污泥樣品中之微生物DNA。其後以細菌16S核醣體核酸小單位基因專一性之引子進行PCR增幅放大，並將增幅片段選殖於TA選殖套組，以建立16S rRNA基因庫，並進行DNA定序與細菌多樣性分析。由4種樣品所得到312個幾乎完整16S rRNA基因的序列，其結果顯示，不同污泥齡的樣品菌相分布有差異，而所屬菌門有Acidobacteria, Actinobacteria, Bacteroidetes, Firmicutes, Gemmatimonadetes, TM7, Planctomycetes, Proteobacteria, Verrucomicrobia 及unclassified Bacteria, 其中以Proteobacteria佔最多數。而在株系的操作分類單位（OTU）的分析中顯示，污泥齡28日的OTU百分比最低，表示活性污泥中的菌相漸趨簡單，以菌屬Rhodobacter最豐富，而 Rhodobacter sphaeroides 是Rhodobacter屬中最有名且用來表現蛋白質之菌種。

關鍵詞：活性污泥、微生物、細菌多樣性。

BACTERIAL DIVERSITY OF ACTIVATED SLUDGE TREATING SLAUGHTERHOUSE WASTEWATER

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The objective of this study was to investigate the bacterial diversity of activated sludge with different sludge retention time (SRT) to treat slaughterhouse wastewater. The microbial DNA of activated sludge samples from SRT 7, 14, 21 and 28 days were extracted directly using a commercial kit and bead-beating protocol, respectively. The 16S ribosomal RNA genes of bacteria from 4 activated sludge samples were amplified with bacterial specific sets of primers by PCR. The amplicons were ligated into TA cloning vectors to construct 16S rRNA gene libraries for DNA sequencing and bacterial diversity analyses. The 312 almost full-length 16S rRNA gene clones from 4 activated sludge samples were obtained. The results indicated that the bacterial profiles comprising of Acidobacteria, Actinobacteria, Bacteroidetes, Firmicutes, Gemmatimonadetes, TM7, Planctomycetes, Proteobacteria, Verrucomicrobia and unclassified Bacteria phyla differed in SRT samples. The most of these communities belonged to Proteobacteria phylum. In OTU analysis, the OTU percentage of SRT28- day sample was low to reveal that the bacterial profile tended towards simplicity, and Rhodobacter was the majority. The Rhodobacter sphaeroides is the most famous species within Rhodobacter genus to express various proteins.

Key Words: Activated sludge, Microorganism, Bacterial diversity.

精子流式細胞儀應用於種公豬精子品質之評估

精子流式細胞儀應用於種公豬精子品質之評估

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精子之細微結構如精子細胞膜、頭帽細胞膜、粒線體膜及染色體的完整性及細胞質內鈣離子濃度均與受精力有密切的關連性。而流式細胞儀可觀測細胞細微結構及各類狀態之儀器，是未來可能成為檢測精子品質之利器。本研究目的乃藉由流式細胞儀針對台灣區種豬發展基金會出場及未出場兩大類年輕種公豬精子之細微結構及組成分加以測定，並建立各項分析值之資料庫以作為未來評估選留產精品質或能力強的種公豬之應用。本試驗採集之新鮮種豬精液儲存於17°C溫度並攜帶回實驗室，分別予以稀釋成0.5×106 /ml濃度，加入所需染劑後於37°C培養數分鐘後上機分析。初步結果顯示在出場（n=205）與未出場（n=85）公豬部分其各項分析項目之初步結果以平均值±標準偏差表示，分別為精子膜完整性（75±23%；69±27%）、頭帽及精子膜完整性（40±22%與36±25%）、粒腺體不完整性（28±18%與31±20 %）、細胞內游離鈣水平的檢測（443±98與443±89）、高鈣精子之比率（83±20%與83±17 %）、DNA染色質結構完整性（94±7%與92±11%）、精子細胞內自由基程度(71±17%與67±21%)。

關鍵語：種豬、精子品質、流式細胞儀

ASSESSMENT OF BOAR SPERM QUALITY BY FLOW CYTOMETER

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The fertility of sperm is related to its structures such as the integrity of sperm membrane, acrosomal membrane, mitochondrial membrane, chromatin and the calcium reservation inside the cytoplasm. Flow cytometer can be used to determine cell structure and the composition of cytoplasm and could be a very useful equipment to determine the semen quality. The purpose of this study was to develop an evaluation system of sperm quality for establishing the database of selection standards for boars. For determination of sperm quality of the boars from Formosan Farmers Association, the semen of each boar was collected and stored at 17°C and diluted to 0.5×106 /mL. After mixing with specific dyes, the semen was incubated at 37°C for couple minutes before analyzing. The results showed that the sperm characteristics of boars for auction (n=205) and not auction (n=85), respectively, were as below (%): sperm membrane integrity (75±23%; 69±27%), intact acrosome (40±22%; 36±25%), depolarized mitochondria (28±18%; 31±20 %), calcium mean level (443±98; 443±89), high calcium level sperm (83±20%; 83±17 %), intact chromatin structure (94±7%; 92±11%), oxidation degree (71±17%; 67±21%).

Key words: Breeding pigs, Sperm Quality, Flow Cytometer

應用精子體能分析儀評估紅羽土雞精液性狀之研究

應用精子體能分析儀評估紅羽土雞精液性狀之研究

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為建立完善之精液性狀評估系統與提昇種土雞生產效益，本試驗利用畜試所輔導進駐育成中心之種雞場所選育之紅羽土雞種雞群進行精液性狀檢測，評估種雞產精能力及精液品質。檢測項目包含：存活率、頭帽及精子膜完整率、粒線體完整率、鈣離子濃度及細菌數。某民間種雞場送檢12隻約25周齡之紅羽土雞精液，經精子體能分析儀檢測結果為精子存活率其排名前50%平均值與最佳值各為94.90%及98.21%、活精且頭帽完整率各為98.33%及99.06%、線粒體膜完整性各為99.12%及100%、鈣離子濃度各為257.38AU及188.82AU、細菌數各為2.4 x 105個/ml及5 x 104個/ml。試驗結果經分析後可得排名前50%平均值與最佳值，分別可作為該項之選留標準及性狀最優者。檢測結果進一步可評估其產精能力，並應用於種雞選留時。

關鍵語：紅羽土雞、精液性狀

APPLYING EASYCYTE TO ESTIMATE QUALITY OF RED FEATHER NATIVE CHICKEN SEMEN

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To establish a comprehensive semen quality evaluation system and to enhance the efficiency of breeding and productivity of native chicken, this study use semen samples of native Taiwan red feather chicken provided by the breeding farm under the program of the Innovation Incubator Center of Livestock Research Institute to develop a evaluation system on quality and productivity of Taiwanese rooster semen. The objective of this study mainly examines semen: viability (survival rate), acrosome and sperm membrane integrity, mitochondria integrity (mitopotential), calcium level and bacterial count. The semen of 12 red feather native chickens about 25 weeks old from the native chicken breeding farm was analyzed by EASYCYTE. We found: the 50th percentile average and maximum viability of our sample are 94.90% and 98.21% respectively. Similarly, the corresponding 50th percentile average and maximum value of intact acrosome and sperm membrane of the sample are 98.33% and 99.06% respectively; the intact mitochondria are 99.12% and 100% correspondingly; with calcium level of 257.38AU and 188.82AU and the bacterial count of 2.4 x 105 /mL and 5 x 104 /mL respectively. The 50th percentile average and maximum value of the sample can be used as the selection criterion for roosters breeding. The findings can further be used to evaluate and estimated sperm productivity and performance and can be applied to select breeding roosters.

Key Words: Red feather native chicken, Quality of semen

應用雙頻讀取器協助收集雞隻產蛋記錄

應用雙頻讀取器協助收集雞隻產蛋記錄

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為節省雞隻產蛋資料紀錄與資料輸入的人工花費，降低錯誤資料輸入的機率，本試驗利用現有亞洲地區通用的 134.2kHz全雙工動物電子標籤與125kHz 電子標籤，結合RFID多頻讀取器依序記錄母雞產蛋日期、動物位置(ANIMAL POSITION)及產蛋狀態，即操作動作 (OPERATION ACTION)，再搭配市售雙頻讀取器隨機轉檔軟體，將資料檔以藍芽傳輸至筆電後利用 EXCEL 的排序 與 LOOKUP 功能，免除資料輸入的人工成本與時間，避免人工輸入所產生之錯誤資料的發生，達成簡易且有效率地收集與建置產蛋數檢定的資料。未來更可結合134.2kHz半雙工標籤，RFID多頻讀取器及搭配市售三頻讀取器隨機轉檔軟體等技術，利用多頻讀取機特點結合動物管理重要原素，時間、動物、人及操作動作 與動物位置，將可應用於畜禽試驗資料收集與建置、動物用藥記錄及畜禽生產之飼養管理。

關鍵語：雞、產蛋記錄、雙頻讀取器

USING DUAL FREQUENCY RFID READER TO RECORDING LAYING EGGS OF HEN

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To achieve less data entry costs and fewer data entry error, a two frequency RFID readers is used to read 125kHz and 134.2kHz RFID electronic tags for cage identification (ANIMAL POSITION)) and type of eggs (OPERATION ACTION) with recorded date-time. The commercial reader with data transfer software, egg collected data can be transferred to computer or

data storage device by bluetooth or USB connection. After EXCEL sorting and LOOKUP functions, the recording system of RFID readers can eliminate manual data entry costs and time and avoid errors arising from manual input, which can simplify the procedure of egg collection. In the future, breeders can use multi-band RFID reader and associated software to achieve data collection of the ids of the manager, animal position and recording date-time and operation action, such as animal medication, feed and feeding and other management information for animal breeding.

Key Words: Chicken, Laying egg records, Dual frequency RFID reader