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乳牛初產月齡提早後之乳量乳質研究

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應用DHI資訊把乳牛初產月齡依分娩年統計各初產月齡之百分比，並檢視其乳量乳質性狀變化，作為乳量乳質與提早初產月齡兼顧的選拔依據。因此，本研究自2002年1月至2012年9月間DHI資料庫www.angrin.tlri.gov.tw選取乳牛初產月齡記錄，進行乳牛初產月齡及其乳量乳質研究。於2002年分娩的5,898頭，初產月齡為24、27或30月齡以內的頭數百分比分別有10%、34%或69%；2011年分娩的4,565頭，初產月齡為24、27或30月齡以內的頭數百分比分別有24%、57%或80%；2012年分娩的3,921頭，初產月齡為24、27或30月齡以內的頭數百分比分別有26%、61%或83%。2011年有187,698個乳樣記錄，年平均單日乳產量、乳脂肪率(F)、蛋白質率(P)、乳糖率、體細胞數、尿素氮、枸橼酸、以及P/F比值分別有24.16Kg、3.70%、3.25%、4.81%、29萬細胞/mL、10.9mg/dL、191mg/dL、以及0.91。當與2002年的220,193乳樣之年平均單日乳產量(21.77Kg)、乳脂肪率(3.73%)、蛋白質率(3.22%)、P/F比(0.89)、乳糖率(4.78%)及體細胞數平均35萬細胞/mL來比較，提早初產月齡後之單日乳量也提高，而乳脂肪率及蛋白質率未受影響，但體細胞數有減少，顯示提早初產月齡後之乳牛產能也改進。因此，台灣乳牛育種策略上，乳量、乳質及繁殖性狀兼顧的選拔方向，也可培育具有適應濕熱環境特色且能在24月齡以內初產的台灣乳牛品種。

關鍵語：乳牛、選育、乳質

REDUCING THE AGE AT FIRST CALVING OF DAIRY COWS AND THEIR SUBSEQUENT MILK PERFORMANCE

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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 with reducing the age of first calving will become a heat-tolerance line in Taiwan. Data were used to study on reducing the age of first calving and their subsequent milk quality and daily milk yield from January of 2002 to September of 2012 based upon www.angrin.tlri.gov.tw. Cows calving in 2002, their age of first calving within 24, 27 or 30 months were 10%, 34% or 69% of 5,898 cows, respectively; as calving in 2011, there were 24%, 57% or 80% of 4,565 cows; and as calving in 2012, there were 26%, 61% or 83% of

3,921 cows. Daily milk yield, milk fat (F), protein (P), lactose, somatic cell counts, urea nitrogen, citric acid and P/F ratio from 187,698 milk samples had yearly mean of 24.16Kg, 3.70%, 3.25%, 4.81%, 290x10³/mL, 10.9mg/dL, 191mg/dL, and 0.91, respectively, as comparison to the average of 220,193 milk samples in 2002 having 21.77Kg daily milk yield, 3.73% fat, 3.22% protein, 0.89 of P/F ratio, 4.78% lactose and 350x10³/mL cell counts in 2002. It indicated that cows reducing the age of first calving did not had a significantly less fat% and protein% in milk along with a less somatic cell counts and a higher daily milk yield. In conclusion, selection on milk yield and quality trait in those of cows at first calving with 24 months old would be feasible under a breeding scheme for heat-tolerance and early mature dairy cattle in Taiwan.

Key Words: Dairy cattle, Selection, Milk quality

耐熱型乳牛之繁殖基因型及其乳量乳質性狀表現

耐熱型乳牛之繁殖基因型及其乳量乳質性狀表現

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台灣耐熱型乳牛選拔標準以DHI泌乳牛群資料庫進行，並應用乳樣DNA進行BLAD、CITL、CVM、DUMPS等四種繁殖基因型檢測。本研究選用2012年4至9月的熱期18,641頭泌乳牛資料，其中有六月次測乳的4,900頭並採用六月次之305-2X-ME乳量平均大於7,500Kg牛隻，計有1,032頭泌乳牛有繁殖基因型資料。所有1,032頭牛之CITL均為TC有利繁殖基因型。DUMPS多為TD有利繁殖基因型，但有2頭是DP雜合型。而其他二種繁殖基因型(BLAD-CVM)分別為BL-CV (1頭)、BL-TV (23頭)、TL-CV (78頭)、TL-TV (928頭)等四類型，其乳量育種價平均分別為+332、+286、+344、+417 Kg；脂肪量育種價平均分別為+6.0、+14.7、+9.9、+14.9 Kg；脂肪率平均分別為3.395、3.883、3.773、3.779%；蛋白質率平均分別為3.504、3.337、3.279、3.280%；乳糖率平均分別為4.686、4.681、4.673、4.748%；體細胞數平均分別為6.1、40.8、33.2、35.3萬個/mL；體細胞數最少值分別為2.4、7.9、5.4、8.8萬個/mL。結果顯示4至9月熱期產乳牛如為TL-TV有利繁殖基因型之牛隻，具有高乳量與高乳質性能表現。

關鍵語：乳牛、選育、基因

REPRODUCTIVE GENOTYPE AND THEIR PERFORMANCE OF MILK YIELD AND QUALITY IN HEAT-TOLERANCE COWS

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Selection of heat-tolerance milking cow in Taiwan is based upon the database of DHI. Cow milk DNA was used to identify the genotype of four reproductive genes such as BLAD, CITL, CVM and DUMPS. There were 18,641 head of milking cows tested on the period of April to September of 2012. A total of 4,900 head having month milk sampling of six and with a mean of 305-2X-ME milk yield greater than 7,500Kg but only 1,032 head having genotypes of reproductive gene of BLAD, CITL, CVM and DUMPS. All of 1,032 cows had favorable genotype of CITL-TC and DUMPS-TD except 2 with DUMPS-DP. Cows with BLAD and CVM genotypes were classified into four groups as follows: BL-CV (n=1), BL-TV (n=23), TL-CV (n=78) and TL-TV (n=928). Four groups of BLAD-CVM genotypes had mean breeding value of 305-2X-ME milk yield with +332, +286, +344 and +417 Kg, respectively; mean breeding value of milk fat with +6.0, +14.7, +9.9 and +14.9 Kg; mean percentage of fat content with 3.395, 3.883, 3.773 and 3.779%; mean percentage of protein content with 3.504, 3.337, 3.279 and 3.280%; mean percentage of lactose content with 4.686, 4.681, 4.673 and 4.748%; mean cell count of somatic cells with 26.1, 40.8, 33.2 and 35.3 x10,000 cells/mL; the lowest number of somatic cell counts with 2.4, 7.9, 5.4 and 8.8 x10,000 cells/mL. Results indicated that cows having a favorable genotypes of TL-TV had production performance on higher milk yield and better milk quality during the hot period from April to September.

Key Words: Dairy cattle, Selection, Gene

純種豬品系選育及品系雜交之基因標記研究

純種豬品系選育及品系雜交之基因標記研究

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純種豬藍瑞斯(L)、約克夏(Y)與杜洛克(D)品種，在肉豬生產體系中提供LYD三品種雜交優勢，進而有終端公豬品種 D品種之品系選育要求。本研究應用豬基因體組之第19號XY性染色體上的基因標記14個：SWR17、SW1325、SW1411、SW2156、SW980、SW2470、SW1522、SW1426、SY11、S0117、SW1943、SN218、SW2059、SW2588來建立純種豬個體的品系雜度%及品系基因差度%。因此，本研究自2010年1月至2012年5月間送檢仔豬群，計20期的生長性能檢定完檢豬隻取DNA樣本進行14個基因標記檢測。選定XY染色體上區SW1325的基因序列長(bp)為品系基因型，D品種(1,223頭)有11個品系(121~165bp)，其中121、151、155、163bp等四個主要品系；L品種(643頭)有13個品系(119~161bp)，其中143、151、153、155、157bp等五個主要品系；Y品種(241頭)有13個品系(115~163bp)，其中149、153、155、161bp等四個主要品系。當XY性染色體上的14個基因標記個別基因型均為純合型的個體數之百分比作為純品系選育程度，在D、L、Y品種分別已有7.4%(91/1223)、3.1%(20/643)、10.4%(25/241)選育為純品系；而D、L、Y品種的品系雜交個體之品系雜度%平均分別為22.3%、28.5%、25.7%；D、L、Y品種內品系雜交個體基因差度%(序列長)平均分別為1.37%(+27bp)、1.35%(+26bp)、1.05%(+20bp)。應用豬基因體組之第19號XY性染色體上的基因標記14個進行純品系選育可行，並有助於種豬場建置其原種族群(GP)與原種族群(GGP)。

關鍵語：基因、選育、品系

GENETIC MARKERS FOR LINE SELECTION AND CROSSING OF PIG PUREBREDS

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Breeding scheme of Landrace(L), Yorkshire(Y) and Duroc(D) for production of three-way cross LYD hog with terminal sire breed of D is a practice of hybrid advantage. A total of 14 genetic markers on sexual chromosomal XY including of SWR17, SW1325, SW1411, SW2156, SW980, SW2470, SW1522, SW1426, SY11, S0117, SW1943, SN218, SW2059, SW2588 was used to conduct the measurements of pure line and gene sequence variation of pig purebreds. Piglets of 20 classes from 2010 January to 2012 May at Pig Performance Test Station were collected their DNA samples during growth performance test. Among of 14 genetic markers, the length of DNA fragment (bp) of SW1325 was designated as the genetic marker of each family line. There were 11 lines varied with 121~165bp in D breed (1,223 head) with a major of four lines on 121, 151, 155, 163bp; L breed (643 head) had 13 lines in 119~161bp of length with a major of five lines on 143, 151, 153, 155, 157bp; and Y breed (241 head) had 13 lines in 115~163bp of length with a major of four lines on 149, 153, 155, 161bp. When an individual having homo-genotypes on all of 14 markers is designated as a pure line animal, then there were 7.4%(91/1223), 3.1%(20/643), 10.4%(25/241) of pure lines in D, L, Y purebreds. Line crossing of D, L, Y purebreds were measured with percentage of hetero-genotypes and there were in average of 22.3%, 28.5%, 25.7%, along with the variation on gene sequence length of 1.37%(+27bp), 1.35%(+26bp), 1.05%(+20bp) in average. In this study, application of 14 genetic markers on sexual chromosomal XY to the line selection of pig purebreds is feasible and is possible to establish a GP and/or GGP breeding stock herd by genomic selection in pig purebreds.

Key Words: Gene, Selection, Line

民間羊場山羊黏多醣症基因頻率與基因多樣性分析

民間羊場山羊黏多醣症基因頻率與基因多樣性分析

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山羊黏多醣症為一種隱性遺傳疾病，主要發生於努比亞品種。本研究自民間種羊場收集199 頭血液 樣品，包括阿爾拜因159 頭、撒能38 頭及吐根堡2 頭。經黏多醣症基因篩檢後，發現僅有三頭阿 爾拜因山羊之基因型為雜合型。進一步追查其系譜後發現此三頭羊含有努比亞血統。同時，亦應用 18 組微衛星型遺傳標記評估75 頭阿爾拜因山羊之基因多樣性，結果顯示其交替基因數、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3

– 11、0.160–0.933、0.151–0.816 及 0.144–0.788，而其平均值則分別為7.2、0.671、0.656及0.616，可得知此群阿爾拜因山羊的基因多樣性具高；多態性資訊。

關鍵語：山羊、黏多醣症、基因多樣性

THE GENE FREQUENCY FOR CAPRINE MUCOPOLYSACCHARIDOSIS IIID AND GENETIC DIVERSITY OF GOATS FROM A PRIVATE GOAT FARM

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Caprine mucopolysaccharidosis type IIID is a recessive inherited disorder which is mainly found in Nubian goats. One of the objectives of this study was to investigate the frequency of N-acetylglucosamine 6-sulfatase gene of goats from a private goat farm. A total of 199 goats including 159 Alpine goats, 38 Saan goats, and 2 Toggenburg goats were examined. The result indicated only 3 Alpine goats were detected as carrier genotype, and the three goats bear Nubian lineage by surveying their pedigrees. Furthermore, a total of 18 microsatellite markers were used to genotype 75 Alpine goat DNA for evaluating their genetic diversity. The results indicated that the values for allele number, observed heterozygosity (H_o), expected heterozygosity (H_e), and polymorphism information content (PIC) of the goats among all loci were in the range of 3–11, 0.160–0.933, 0.151–0.816, and 0.144–0.788, respectively. Moreover, the mean values for allele number, H_o , H_e , and PIC were 7.2, 0.671, 0.656, and 0.616, respectively. The result also indicated that the genetic diversity of the Alpine goats is high ($PIC > 0.5$).

Key Words: Goat, Mucopolysaccharidosis, Genetic diversity

微衛星遺傳標記分析畜產試驗所白色絲羽烏骨雞的遺傳變異

微衛星遺傳標記分析畜產試驗所白色絲羽烏骨雞的遺傳變異

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為評估行政院農業委員會畜產試驗所白色絲羽烏骨雞產蛋數選育族群的遺傳變異。利用FAO(2004)建議使用的23組雞微衛星標記組分析87隻白色絲羽烏骨雞種雞個體DNA。其中除MCW0098、MCW0183及MCW0216三組微衛星標記所檢測的基因型在所有檢測個體皆為單型外，其它20組微衛星標記皆有多態性的基因型。共檢測到72個alleles，平均每個基因座具有3.1個對偶基因(1~7個alleles)；期望異質度介於0到0.819，平均為0.398；觀測異質度介於0到0.828，平均為0.372；多態性訊息含量平均為0.347。在本試驗選用的23組微衛星標記組中有7組呈現高度多態性資訊($PIC \geq 0.5$)。8組呈現中度多態性資訊($0.5 > PIC \geq 0.25$)，8組呈現低度多態性資訊($PIC < 0.25$)。

關鍵語：白色絲羽烏骨雞、遺傳變異、微衛星標記

GENETIC VARIATION ANALYSIS OF LRI-COA WHITE SILKIE CHICKEN BY MICROSATELLITE MARKERS

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In order to evaluate genetic variation of white silkie chicken selection flock in Livestock Research Institute-Council of Agriculture(LRI-COA), Executive Yuan. A set of 23 microsatellite markers recommended for chicken in FAO 's DADIS MoDAD programme were utilized. The study was carried out on 87 birds from breeding flock to generate genotype data. Except 3 microsatellite markers, MCW0098, MCW0183 and MCW0216, all of the other microsatellites were polymorphic with average allelic number 3.1, ranged from 1 to 7 per locus. There were 72 alleles detected in total. The expected heterozygosity ranged from 0 to 0.819, and the average expected heterozygosity was 0.398. The observed heterozygosity of the population ranged from 0 to 0.828, and the average observed heterozygosity was 0.372. The estimated polymorphic information content (PIC) was 0.347. In 23 markers, seven markers were highly informative with polymorphism information content (PIC ≥ 0.5), eight markers were reasonably informative($0.5 > \text{PIC} \geq 0.25$) and the other eight markers were slightly informative (PIC < 0.25).

Key Words: White silkie chicken, Genetic variation, Microsatellite marker

黑色絲羽烏骨雞之微衛星遺傳標記分析

黑色絲羽烏骨雞之微衛星遺傳標記分析

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為評估行政院農業委員會畜產試驗所黑色絲羽烏骨雞族群的遺傳變異，利用FAO (2004)建議使用的23組雞微衛星標記組分析90隻白色絲羽烏骨雞種雞個體DNA。此23微衛星標記所檢測的結果皆有多態型的基因型。共檢測到79個alleles，平均每個基因座具有3.4個對偶基因(2~7個alleles)，其期望異質性介於0.125到0.746，平均為0.465；觀測異質性介於0.067到0.789，平均為0.448；多態性訊息含量平均為0.404。在本試驗選用的23組微衛星標記組中6組呈現高度多態性資訊 (PIC ≥ 0.5)，13組呈現中度多態性資訊 ($0.5 > \text{PIC} \geq 0.25$)，4組呈現低度多態性資訊 (PIC < 0.25)。

關鍵語：黑色絲羽烏骨雞、遺傳變異、微衛星標記

GENETIC VARIATION ANALYSIS OF LRI-COA BLACK SILKIE CHICKEN BY MICROSATELLITE MARKERS

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In order to evaluate genetic variation of black silkie chicken flock in Livestock Research Institute-Council of Agriculture (LRI-COA), Executive Yuan. A set of 23

microsatellite markers recommended for chicken in FAO's DADIS MoDAD programme were utilized. The study was carried out on 90 birds from breeding flock to generate genotype data. All of the 23 microsatellites were polymorphic with average allelic number 3.4, ranged from 2 to 7 per locus. There were 79 alleles detected in total. The expected heterozygosity ranged from 0.125 to 0.746, and the average expected heterozygosity was 0.465. The observed heterozygosity of the population ranged from 0.067 to 0.789, and the average observed heterozygosity was 0.448. The estimated polymorphic information content (PIC) was 0.404. In 23 markers, six markers were highly informative with polymorphism information content (PIC \geq 0.50), 13 markers were reasonably informative ($0.5 > \text{PIC} \geq 0.25$) and the other four markers were slightly informative ($\text{PIC} < 0.25$).
Key Words: Black silkie chicken, Genetic variation, Microsatellite marker

甘油抗凍劑對土雞冷凍精液性能之影響

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為保存動物遺傳資源，除可藉由擴大族群數目達成，保存生殖細胞亦為有效之方法。然而，母禽生殖細胞之保存有其先天限制，無法似哺乳類般取其母細胞或胚；種原保存，故目前僅能自雄禽取其細胞凍存作為保種。製作凍液之過程中，諸因素對解凍後液之受能力具密切關係，如稀釋液、抗凍劑、保存方式、凍與解凍速與解凍後對有害物質(如甘油)之移除等。目前普遍使用於家禽凍液包括不同抗凍劑(甘油/DMA/DMSO)、保存方式(粒狀/安瓶/麥管)、降溫速率(快速/慢速)等方式。研究指出，甘油/慢速降溫/麥管或DMA/快速降溫/粒狀組合模式可獲得較高受精率，然而若是考量種原庫之生物安全性及身分辨識準確度，前者仍是較為理想之方法。故本試驗旨在探討甘油抗凍劑對土雞精子存活率、頭帽完整性、粒線體膜電位、鈣含量及DNA結構等影響以評估甘油對精子造成何種程度之傷害。

關鍵語：甘油抗凍劑、土雞、頭帽完整性

Effects of glycerolized cryoprotectant on CHICKEN Semen Cryopreservation

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Animal genetic resources could be conserved by increasing populations; moreover, to preserve reproductive cells is an efficient method as well. However, due to the specific egg characteristics, oocyte or embryo cryopreservation is not appropriate for birds, so semen cryopreservation is still the most practical way to date. Many factors could affect the results of semen cryopreservation, such as the different types of cryoprotectants, packaging and cooling rates. Several studies showed that the highest fertility rates by

artificial insemination (AI) obtained either with semen frozen using glycerol/straws/slowly cooling or dimethyl acetamide (DMA)/pellet/rapidly cooling methods. Nevertheless, considering about cryobanking, which demands high level of biosecurity and accurate identification, the former method is still the best way to preserve avian semen. Hence, the purpose of this study was to evaluate the influence of glycerolized cryoprotectants on chicken spermatozoa viability, acrosome integrity, mitochondria activity, calcium level and DNA status of chicken semen to assess the damage of sperm caused by the glycerol element.

Key Words: Glycerolized cryoprotectants, Native chicken, Acrosome integrity

年輕種公豬精液品質之評估

年輕種公豬精液品質之評估

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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、細胞質內鈣離子濃度及氧化傷害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產業協會自2012年一月份至十月份之出場及未出場兩大類年輕種公豬之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℃溫度並攜帶回實驗室，分別予以稀釋成 0.5×10^6 /ml濃度，加入所需染劑後於37℃培養數分鐘後上機分析。初步結果顯示在出場（n=273）與未出場（n=130）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（ $77 \pm 19\%$ ； $72 \pm 27\%$ ）、頭帽及精子膜完整性（ $52 \pm 23\%$ ； $47 \pm 25\%$ ）、粒腺體不完整性（ $33 \pm 19\%$ ； $37 \pm 25\%$ ）、細胞內游離鈣水平的檢測（ 452 ± 66 ； 474 ± 101 ）、高鈣精子之比率（ $85 \pm 10\%$ ； $81 \pm 15\%$ ）、DNA染色質結構完整性（ $96 \pm 3\%$ ； $94 \pm 9\%$ ）、精子細胞內自由基程度（ $57 \pm 26\%$ ； $52 \pm 28\%$ ）。

關鍵語：種豬、精子品質、流式細胞儀

ASSESSMENT OF YOUNG STOCK BOAR SEMEN QUALITY

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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 semen collected from Formosan Farmers Association in 2012, the semen of each boar was collected and stored at 17 °C and diluted to 0.5×10^6 /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=273) and not auction (n=130), respectively, were as below (%): sperm membrane integrity ($77 \pm 19\%$; $72 \pm 27\%$), intact acrosome ($52 \pm 23\%$; $47 \pm 25\%$), depolarized mitochondria ($33 \pm 19\%$; $37 \pm 25\%$), calcium mean level (452 ± 66 ; 474 ± 101), high calcium level sperm ($85 \pm 10\%$; $81 \pm 15\%$), intact chromatin structure ($96 \pm 3\%$; $94 \pm 9\%$), oxidation degree ($57 \pm 26\%$; $52 \pm 28\%$).

Key words: Breeding pigs, Sperm Quality, Flow Cytometer

台灣杜洛克公豬與配藍瑞斯母豬繁殖性能之研究

台灣杜洛克公豬與配藍瑞斯母豬繁殖性能之研究

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培育台灣杜洛克新品種的目標是將多產基因MM型帶入公豬，並取代美國杜洛克成為雜交肉豬之終端公豬。本試驗選定R2與R3代台灣杜洛克公豬與畜產試驗所育種場與民間肉豬場的藍瑞斯母豬進行雜交試驗，試驗收集17胎（育種場12胎與民間場5胎），試驗母豬均包括初產與經產母豬。試驗結果：育種場與民間肉豬場分別為出生窩仔數 9.33 ± 3.65 與 11.20 ± 1.79 頭；出生活仔數 8.33 ± 2.67 與 9.40 ± 1.34 頭；出生體重 1.84 ± 0.53 與 1.98 ± 0.33 公斤；21日齡體重 8.36 ± 11.09 公斤；70日齡體重 30.61 ± 5.11 公斤(肉豬場無進行21與70日齡秤重)；乳頭數 13.20 ± 1.24 個，試驗結果顯示，台灣杜洛克公豬作為終端公豬在民間肉豬場的出生窩仔數、出生活仔數與出生體重比育種場有較優良表現。

關鍵語：台灣杜洛克、繁殖、母豬

Study on Reproductive Performance of Landrace Sows Mated with Taiwan Duroc Boars

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The breeding objective for new Taiwan Duroc boars was to introduce MM genotype of the prolific gene into the boars, and to replace the American Duroc to become the terminal sire used in meat production. In this study, Taiwan Duroc boars of the R2 and R3 generation were mated with Landrace sows from breeding farm (Livestock Research Institute, LRI) and pig farm. Data on reproductive performance, including litter size at birth, piglet born alive, body weight (BW) at birth, BW at 21 days of age, BW at 70 days

of ages, litter size at weaning, and teat number of 17 litters of sows were collected from LRI and pig farms. The results showed that litter size at birth, piglet born alive, and body weight (BW) at birth in breeding farm and pig farm were 9.33 ± 3.65 and 11.20 ± 1.79 ; 8.33 ± 2.67 and 9.40 ± 1.34 ; 1.84 ± 0.53 and 1.98 ± 0.33 kg, respectively, and BW at 21 days of age, BW at 70 days of ages, and teat number in breeding farm were 8.36 ± 11.09 kg, 30.61 ± 5.11 kg and 13.20 ± 1.24 , respectively. These results revealed that the litter size at birth, piglet born alive, and body weight (BW) at birth of sows from pig farms mated with new Taiwan Duroc boars was better than those of breeding farm.

Key Words: Taiwan Duroc, Reproductive Performance, Sow

調查台灣黑豬場種豬之緊迫與多產基因頻率

調查台灣黑豬場種豬之緊迫與多產基因頻率

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為協助台灣黑豬場進行基因選種，本試驗應用緊迫與多產基因檢測技術對7家台灣黑豬場，5個品種（高畜黑豬、梅山豬、桃園豬、六堆黑豬及雜交黑豬），共171頭種豬進行基因檢測。試驗結果顯示，在緊迫基因Hal-1843中，CC型（正常型）頻率分別為1.000、1.000、1.000、0.966及0.928，CT型（雜合型）頻率則為0.000、0.000、0.000、0.034及0.072，TT型（緊迫型）頻率則為0.000、0.000、0.000、0.000及0.000；其中T緊迫基因頻率分別為0.000、0.000、0.000、0.017與0.036。在多產基因ESR中，AA型（非多產型）頻率分別為0.000、0.000、0.211、0.069及0.478，AB型（雜合型）為0.000、0.000、0.578、0.276及0.218，BB型（多產型）為1.000、1.000、0.211、0.655及0.304；其中B多產基因頻率分別為1.000、1.000、0.500、0.793及0.413。由試驗結果得知，在六堆黑豬與雜交黑中仍存在少數緊迫基因，而桃園豬與雜交黑豬在多產基因選種上仍有很大的發展空間，未來將持續協助業者將不良基因剔除以利後續黑豬選種。

關鍵語：黑豬、緊迫基因、多產基因

Investigation on the Frequencies of Halothane and Estrogen Receptor Genes of Breeding Pigs among Black Pig Farms in Taiwan

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In order to assist the gene selection of the Black pig farms in Taiwan, 171 breeding pigs, includes five breeds such as the KHAPS Black pigs, Meishan pigs, Taoyuan pigs, Liou-Duai Black pigs, and hybrid Black pigs, were used for preliminary investigating the gene frequency distribution of halothane (Hal-1843) and estrogen receptor (ESR) genes. The results showed that the CC, CT and TT (stress-sensitive type) genotype frequencies of

Hal-1843 gene, were 1.000, 0.000 and 0.000 in KHAPS Black pigs; 1.000, 0.000 and 0.000 in Meishan pigs; 1.000, 0.000 and 0.000 in Taoyuan pigs; 0.966, 0.034 and 0.000 in Liou-Duai Black pigs; and 0.928, 0.072 and 0.000 in hybrid Black pigs, respectively. And the T allele frequency of Hal-1843 gene for KHAPS Black pigs, Meishan pigs, Taoyuan pig, Liou-Duai Black pig and hybrid Black pigs was 0.000, 0.000, 0.000, 0.017 and 0.036, respectively. In addition, the AA (non-prolific type), AB and BB (prolific type) genotype frequencies of ESR gene were, 0.000, 0.000 and 1.000 in KHAPS Black pigs; 0.000, 0.000 and 1.000 in Meishan pigs; 0.211, 0.578 and 0.211 in Taoyuan pigs; 0.069, 0.276 and 0.655 in Liou-Duai Black pigs; and 0.478, 0.218 and 0.304 in hybrid Black pigs, respectively. And the B allele frequency of ESR gene for KHAPS Black pigs, Meishan pigs, Taoyuan pigs, Liou-Duai Black pigs, and hybrid Black pigs was 1.000, 1.000, 0.500, 0.793 and 0.413, respectively. These results demonstrated that there still have stress-sensitive gene existed with low percentage in Liou-Duai and hybrid Black pigs, and there is massive potential for ESR gene selection in Taoyuan pigs and hybrid Black pigs. We will continually to help the Black pig industry to remove these unfavorable genes in the future.

Key Words: Black Pigs, Halothane Gene, ESR Gene

台灣杜洛克豬與其雜交肉豬屠體性狀評估

台灣杜洛克豬與其雜交肉豬屠體性狀評估

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培育台灣杜洛克新品種是為了提升杜洛克豬隻繁殖性能，選用經基因選種之高畜黑公豬與配杜洛克母豬，經過雜交與級進四代選育，目前已達初步選種目標。本試驗目的是評估選育過程是否影響台灣杜洛克豬與其雜交肉豬的屠體性狀。本試驗共屠宰台灣杜洛克豬 (R) 19頭(閹公豬10頭與女豬9頭)與其雜交肉豬 LR (L × R) 25頭 (閹公豬16頭與女豬9頭)，試驗結果不分性別LR與R豬隻分別為屠體重 102.19 ± 3.56 與 97.08 ± 3.81 公斤；屠宰率 87.44 ± 2.25 與 87.00 ± 3.66 %；瘦肉率 53.48 ± 1.90 與 53.38 ± 2.26 %；脂肪率 10.20 ± 1.96 與 9.45 ± 1.74 %；骨骼率 15.16 ± 1.45 與 15.47 ± 0.97 %；背脂厚度 2.18 ± 0.34 與 1.94 ± 0.33 公分；腹脂厚度 2.45 ± 0.29 與 2.44 ± 0.39 公分；腰眼面積 51.82 ± 6.74 與 48.45 ± 5.17 平方公分；屠體長 105.42 ± 2.59 與 101.82 ± 2.30 公分；肋骨數 15.38 ± 0.48 與 15.37 ± 0.50 對。試驗結果與畜產試驗所過去研究比較，LR與R豬隻在背脂厚度、腰眼面積與屠體長等屠體性狀均不比盤克夏、藍瑞斯、約克夏、杜洛克與高畜黑豬差；另外屠宰率、瘦肉率與脂肪率有比高畜黑豬較佳的趨勢。

關鍵語：台灣杜洛克、屠體性狀、評估

Evaluation on the Carcass Traits of Taiwan Duroc and Its Hybrid Hogs

C. H. Chen, N. T. Yen, T. C. Wan, W. S. Chen and M. C. Wu

The breeding goal of new Taiwan Duroc boars was to enhance the reproductive performance of Duroc. The Duroc sows have mated with KHAPS Black Pig boars selected by gene selection, and the preliminary goals of breeding and selection for Taiwan Duroc boars have reached after upgrading breeding programs. The purpose of this study was to evaluate whether the carcass traits of Taiwan Duroc and its hybrids were effected by upgrading breeding process. Data on carcass traits, including carcass weight (kg), dressing percentage (%), lean percentage (%), fat percentage (%), bone percentage (%), backfat thickness (cm), abdominal fat thickness (cm), loin eye area (cm²), carcass length (cm), and pairs of ribs in 19 of Taiwan Duroc (R; 10 barrows and 9 gilts) and 25 of its hybrids LR (L × R ; 16 barrows and 9 gilts), were collected. Regardless of gender, the results showed that carcass weight (kg), dressing percentage (%), lean percentage (%), fat percentage (%), bone percentage (%), backfat thickness (cm), abdominal fat thickness (cm), loin eye area (cm²), carcass length (cm), and pairs of ribs in LR and R pigs were 102.19 ± 3.56 and 97.08 ± 3.81 ; 87.44 ± 2.25 and 87.00 ± 3.66 ; 53.48 ± 1.90 and 53.38 ± 2.26 ; 10.20 ± 1.96 and 9.45 ± 1.74 ; 15.16 ± 1.45 and 15.47 ± 0.97 ; 2.18 ± 0.34 and 1.94 ± 0.33 ; 2.45 ± 0.29 and 2.44 ± 0.39 ; 51.82 ± 6.74 and 48.45 ± 5.17 ; 105.42 ± 2.59 and 101.82 ± 2.30 ; 15.38 ± 0.48 and 15.37 ± 0.50 , respectively. Here, these results were compared with the results presented from Livestock Research Institute before, the backfat thickness, loin eye area and carcass length in LR and R pigs were similar to those of Berkshire, Landrace, Yorkshire, Duroc and KHAPS Black Pig. In addition, the dressing, lean and fat percentage in LR and R pigs were better than those of KHAPS Black Pigs.

Key Words: Taiwan Duroc, Carcass Traits, evaluation

核心豬群產仔頭數及其仔豬三週齡體重之品種比較

核心豬群產仔頭數及其仔豬三週齡體重之品種比較

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畜產試驗所育種場前身為核心豬場南站，在 2002年之後其場內有純種豬藍瑞斯(L)、約克夏(Y)、杜洛克(D)及盤克夏(B)四個品種。本研究應用從2002年至2011年底分娩之 449胎L (35父畜與133母畜)、89胎Y (5父畜與23母畜)、135胎D (10父畜與39母畜)及155胎B (10父畜與 49母畜)，進行純種豬繁殖性能之分析，分析性狀包括出生窩仔數、出生活仔數、出生體重及21日齡體重。各品種之間，就出生窩仔數與出生活仔數兩性狀而言，L最高，且顯著高於Y (P

關鍵語：核心豬群、純種豬、繁殖性能

COMPARISON OF PUREBRED FOR LITTER SIZE AND PIGLET BODY WEIGHT AT THREE WEEKS OF AGE IN A NUCLEAR HERD

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Breeding Farm of Livestock Research Institute is the predecessor of the South Division of National Swine Nucleus Herd. There were four purebreds, i.e., Landrace (L), Yorkshire (Y), Duroc (D) and Berkshire (B) since 2002 in the Breeding Farm. The reproductive records including litter size at birth, number born alive, and body weights at birth and at 21 days from 449 litters of Landrace (from 35 sires and 133 sows), 81 litters of Yorkshire (5 sires and 23 sows), 127 litters of Duroc (10 sires and 39 sows) and 155 litters of Yorkshire (10 sires and 49 sows) purebred sows during 2002 to 2011 in the Breeding Farm were analyzed in this study. Among the breeds, for the litter size at birth and number born alive, L was significantly higher than Y (P

Key Words: Nucleus herd, Purebred pigs, Reproductive performance