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## 採精認證九月齡公豬總精子數之採精季節及品種差異研究

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採精認證九月齡公豬總精子數之採精季節及品種差異研究

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本研究分析2011年至2014年台灣區種豬產業協會所屬會員場的1,119頭參加採精認證9月齡公豬之精液量、精子濃度及總精子數，其中有233頭藍瑞斯、88頭約克夏及798頭杜洛克公豬。採集精液檢測精液量與精子濃度並換算總精子數。結果顯示，比較熱季(4月至9月)與涼季(10月至3月) 在藍瑞斯、約克夏及杜洛克3個品種公豬的精液量、精子濃度與總精子數皆無顯著差異。藍瑞斯公豬在涼季與熱季之平均總精子數分別為723±264億與736±221億，約克夏公豬在涼季與熱季之平均總精子數分別為720±189億與674±230億，杜洛克公豬在涼季與熱季之平均總精子數分別為670±201與689±205億。藍瑞斯公豬之平均總精子數與平均精子濃度在月份間具顯著差異 (P
關鍵語：豬、精子、季節

THE DIFFERENCE OF TOTAL SPERM COUNT ON COLLECTION SEASON AND BREED IN THE SEMEN SAMPLES FROM SEMEN PROVED AT NINE MONTH AGE OF BOAR

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This study traced 1,119 semen samples proved at nine month age of Landrace (N=233), Yorkshire (N=88) and Duroc (N=798) boars from the members of Formosan Farmers Association for Swine Improvement during 2011 to 2014. Each sample was measures for semen volume and concentration of sperm(COS). And total sperm count (TSC) was converted by semen volumes and concentration of sperm. No significantly different was found between hot season (Apr.-Sep.) and cool season (Oct.-Mar.) on semen volume and concentration and TSC of boar semen in Landrace, Yorkshire and Duroc. The average TSC of Landrace, Yorkshire and Duroc boars in hot season and cool season were 72.3±26.4 and 73.6±22.1, 72.0±18.9 and 67.4±23.0, and 67.0±20.1 and 68.9±20.5 billion sperms/ml, respectively. There were significantly different among of months of TSC and COS in Landrace boars (P
Key Words: Pig, Sperm, Season

**畜試土雞近親品系L12之微衛星遺傳標記多樣性分析**

畜試土雞近親品系L12之微衛星遺傳標記多樣性分析

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為評估行政院農業委員會畜產試驗所畜試土雞台畜一號近親品系L12選育族群的遺傳變異，本試驗利用FAO(2004)建議使用的23組雞微衛星標記組，以及LEI0258微衛星標記組，共24組微衛星標記組分析該族群候選種雞80隻之個體DNA。24組微衛星標記皆有多態型的基因型。共檢測到65個對偶基因，平均每個基因座具有2.7個對偶基因(2~6個)，其期望異質度介於0.061到0.657，平均為0.40，觀測異質度介於0.038到0.888，平均為0.41，而多態性訊息含量平均為0.34。在選用的24組微衛星標記組中有6組呈現高度多態性資訊(PIC ≥ 0.5)，有11組呈現中度多態性資訊(0.5> PIC ≥ 0.25)，7組呈現低度多態性資訊(PIC
關鍵語：土雞、遺傳多樣性、微衞星標記

GENETIC DIVERSITY ANALYSIS OF INBREEDING LINE L12 NATIVE CHICKEN IN LRI-COA BY MICROSATELLITE MARKERS

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In order to evaluate genetic variation of inbreeding line L12 native chicken flock in Livestock Research Institute-Council of Agriculture (LRI-COA), Executive Yuan. We use a set of 24 microsatellite markers to analyze 80 candidate bred chickens from this flock. All the microsatellites were polymorphic. The average allelic number was 2.7, ranged from 2 to 6 per locus. The expected heterozygosity ranged from 0.061 to 0.657, and the average expected heterozygosity was 0.40±0.19 (mean ±SD). The observed heterozygosity of the population ranged from 0.038 to 0.888, and the average observed heterozygosity was 0.41 ±0.23. The estimated average polymorphic information content (PIC) was 0.34±0.16. In 24 markers, six markers were highly informative with polymorphism information content (PIC ≥0. 50), eleven markers were reasonably informative (0.5> PIC≥ 0.25) and the other seven markers were slightly informative (PIC
Key Words: Native chicken, Genetic diversity, Microsatellite marker

**高飼效種公豬之精子粒線體完整度檢測**

高飼效種公豬之精子粒線體完整度檢測

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本研究目的旨在以流式細胞儀測定高飼料效率年青種公豬之精液濃度及精子粒線體完整度，藉以評估年青公豬產精能力與成熟度，期提早應用優質的高飼料效率種公豬於種豬繁殖及肉豬生產上，以加速優質基因之擴散利用。測定之年青種公豬為財團法人中央畜產會種豬性能檢定站201403期與201404期完檢之杜洛克、藍瑞斯及約克夏等3個品種計114頭公豬。種公豬於拍賣前20天採集精液，採集之新鮮精液儲存於17°C保溫攜回實驗室測定精液濃度及同步快速測定每頭公豬精液至少5,000隻精子之粒線體完整度，作為判別年青公豬產精能力指標。檢測結果顯示，飼料效率較佳之前50%公豬（飼料效率介於1.89至2.03）與飼料效率較差之後50%公豬（飼料效率介於2.04至2.14）其精液濃度及精子粒線體完整度分別為3.12 ± 1.30億/毫升、63.9 ± 17.3%與3.85 ± 1.42億/毫升、74.0 ± 13.1%。完檢之飼料效率較佳的前50%公豬之精液濃度及精子粒線體完整度均顯著較飼料效率較差之後50%公豬表現為差（P
關鍵語：飼料效率、精子、粒線體完整性

CYTOMETRIC MEASUREMENT OF SPERM MITOCHONDRIAL INTEGRITY IN HIGH FEED EFFICIENCY BOAR

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The objective of this study was conducted to measure the sperm concentration and mitochondrial integrity by using flow cytometer to evaluate the semen productive ability and maturity of high feed efficiency (FE) young boar, and try to apply the elite young boar for the reproduction of breeding stock and the production of meat pig. A total of 114 finished test boars from 3 breeds (Duroc, Landrance and Yorkshire) in class 201403 and 201404 of the Pig Performance Testing Station of National Animal Industry Foundation were used at this project. We collected the semen 20 days before the auction and stored at 17°C. The collected semen were immediately analyzed the sperm concentration and mitochondrial integrity at least 5,000 sperm each semen to assess the semen productive ability of young boar. The results showed that the sperm concentration and mitochondrial integrity of the young boars from better FE (56 boars with FE 1.89 ~ 2.03) and from inferior FE (58 boars with FE 2.04 ~ 2.14) were 312 ± 130 (106/ml), 63.9 ± 17.3 (%) and 385 ± 142 (106/ml), 74.0 ± 13.1 (%), respectively. These measurements were significantly difference (P
Key Words: Feed efficiency, Sperm, Mitochondrial integrity

**畜試土雞高產蛋品系L7產蛋性能改進**

畜試土雞高產蛋品系L7產蛋性能改進

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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。行政院農業委員會畜產試驗所以畜試土雞台畜一號近親品系L7族群進行高產蛋數選育，經6個世代對產蛋數的選育，G0世代母雞之產第1個蛋的平均產第1個蛋的日齡、平均體重及平均蛋重分別為160天、1,560公克及30.5公克，G6世代母雞則分別為147天、1,801公克及33.6公克，世代間皆存在顯著性的差異(P
關鍵語：土雞、產蛋性能、選育

IMPROVEMENT OF EGG PRODUCTION PERFORMANCE IN LRI NATIVE CHICKEN LINE L7

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In order to establish the platform for improve egg production performance in native chicken. High egg number hens were selected for breeding from inbreeding lines L7 of Livestock Research Institute. After six generations of selection for number of eggs production, there were significant differences of the age at first egg(AFE), body weight at first egg(BWAFE), body weight at 40 weeks(BW40), Egg weight at 40 weeks(EW40), number of eggs laid up to 40 weeks of age(EN40) were detected among the generations (P
Key Words: Native chicken, Egg production performance, Selection

**畜試土雞高產蛋品系近親係數分析**

畜試土雞高產蛋品系近親係數分析

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畜試土雞高產蛋品系係以行政院農業委員會畜產試驗所畜試土雞台畜一號L7、L9、L11及 L12 等四個近親品系為基礎族群。此四個近親品系在2008年以前是以全同胞配種所建立的品系，而畜試土雞高產蛋品系為自2008年開始進行6個世代產蛋數選育所育成的品系。為瞭解育成品系之近親係數，取用1986年至2014年的畜試土雞之系譜資料進行近親係數分析。品系L7、L9、L11及 L12的系譜資料分別有15,100隻、17,023 隻、20,668 隻 及 15998 隻。分析結果，畜試土雞高產蛋品系L7、L9、L11及L12在2006年的G0世代雞隻之近親係數分別為0.8943 ± 0.0228、0.8859 ± 0.0642、0.8418 ± 0.0546 及 0.8696 ± 0.0512。而在2014年的G8世代雞隻之近親係數分別為0.8318 ± 0.0107、0.8144 ± 0.0120、0.7926 ± 0.0146及0.8031 ± 0.0119。因畜試土雞高產蛋品系非全同胞配種品系L7、L9、L11及L12雞群之近親係數皆略為降低，然而又隨著選育世代數增加各品系近親係數亦隨之增高。

關鍵語：土雞、近親品系、高產蛋品系、近親係數

INBREEDING COEFFICIENTS OF HIGH EGG PRODUCTION LINES IN LRI NATIVE CHICKEN

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LRI native chicken-high egg production lines, which was selected for number of eggs based on the inbreeding lines, L7,L9, L11, L12, native chicken of Council of Agriculture Livestock Research LRI for six generation. The inbreeding selection was one generation per year by full-sib mating practiced from 1986 to 2006. Breeding strategy was changed to enhance the egg production from 2008 which selection enhanced on egg production performance, full-sib mating ignored. To assess the inbreeding coefficients of high egg production line breeding populations, we use pedigree data from 1986 to 2014 to analyze the inbreeding coefficients of breeding flocks in each generation. Total pedigree data were 15,100 birds, 17,023 birds, 20,668 birds and 15,998 birds, respectively. The inbreeding coefficients of high egg production line L7, L9, L11 and L12 native chickens in generation G0 at 2006 were 0.8943 ± 0.0228, 0.8859 ± 0.0642, 0.8418 ± 0.0546 and 0.8696 ± 0.0512, respectively. The inbreeding coefficients of high egg production line L7, L9, L11 and L12 native chickens in generation G8 at 2014 were 0.8318 ± 0.0107, 0.8144 ± 0.0120, 0.7926 ± 0.0146 and 0.8031 ± 0.0119, respectively. Results showed the inbreeding coefficients of high egg production line breeding populations in all of the four lines were decrease. However, the inbreeding coefficients of these four lines increased with increasing generation.

Key Words: Native chicken, Inbreeding line, High egg production line, Inbreeding coefficient

**畜試土雞近親品系L9之微衛星遺傳標記多樣性分析**

畜試土雞近親品系L9之微衛星遺傳標記多樣性分析

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為評估行政院農業委員會畜產試驗所畜試土雞台畜一號近親品系L9選育族群的遺傳變異，本試驗利用FAO(2004)建議使用的23組雞微衛星標記組，以及LEI0258微衛星標記組，共24組微衛星標記組分析該族群候選種雞80隻之個體DNA。其中除MCW0216與MCW0081兩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22組微衛星標記皆有多態型。共檢測到72個對偶基因，平均每個基因座具有3.0個對偶基因(1~6個)，其期望異質度介於0到0.734，平均為0.49，觀測異質度介於0到0.838，平均為0.47，而多態性訊息含量平均為0.42。在選用的24組微衛星標記組中有10組呈現高度多態性資訊(PIC ≥ 0.5)，有11組呈現中度多態性資訊(0.5> PIC ≥ 0.25)，3組呈現低度多態性資訊(PIC
關鍵語：土雞、遺傳多樣性、微衞星標記

GENETIC DIVERSITY ANALYSIS OF INBREEDING LINE L9 NATIVE CHICKEN IN LRI-COA BY MICROSATELLITE MARKERS

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In order to evaluate genetic variation of inbreeding line L9 native chicken flock in Livestock Research Institute-Council of Agriculture (LRI-COA), Executive Yuan. We use a set of 24 microsatellite markers to analyze 80 candidate bred chickens from this flock. Except MCW0216 and MCW0081, all of the microsatellites were polymorphic. The average allelic number was 3.3, ranged from 1 to 6 per locus. The expected heterozygosity ranged from 0 to 0.734, and the average expected heterozygosity was 0.49±0.21 (mean ±SD). The observed heterozygosity of the population ranged from 0 to 0.838, and the average observed heterozygosity was 0.47±0.26. The estimated average polymorphic information content (PIC) was 0.42±0.19. In 24 markers, seven markers were highly informative with polymorphism information content (PIC ≥0. 50), eleven markers were reasonably informative (0.5> PIC≥ 0.25) and the other six markers were slightly informative (PIC
Key Words: Native chicken, Genetic diversity, Microsatellite marker

**牛脊椎畸形複合症(CVM)遺傳缺陷之SSCP基因型檢測**

牛脊椎畸形複合症(CVM)遺傳缺陷之SSCP基因型檢測

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脊椎畸形複合症（Complex Vertebral Malformation, CVM）是一種乳牛重要的遺傳缺陷，為單一基因突變的顯隱性遺傳。為建立簡易的分子生物學檢測遺傳型的方法，本研究開發CVM 的單股構型多態性DNA片段分析(PCR_SSCP)基因型檢測方法，設計CVM引子組，以血液或牛乳DNA檢體為模板，經PCR 增幅出109 bp的PCR DNA片段，再以SSCP進行電泳染色分析得到不同態樣的基因型。檢測台灣南部一家乳牛場全場458頭乳牛個體血樣DNA，結果有5.5%(25/458)為雜合型(CV, heterozygote)個體，94.5%(433/458)為正常型(TV, test free of CVM)個體，沒有檢出有病型(CVM, affected of CVM)的個體。分析台灣DHI 乳牛群856頭乳牛個別乳DNA樣品，有11.4%(98/856)為雜合型個體，沒有檢出有病型的個體。本試驗開發出第一個可作為監測台灣乳牛群脊椎畸形複合症遺傳缺陷的檢測方法。

關鍵語：乳牛、牛脊椎畸形複合症、遺傳缺陷、單股構型多態性DNA片段分析

SSCP GENOTYPING FOR INHERITED DEFICIENCY OF BOVINE COMPLEX VERTEBRAL MALFORMATION

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A method was established to detect complex vertebral malformation (CVM) from blood and milk samples of Holstein dairy cattle in Taiwan using polymerase chain reaction-single strand conformation polymorphism (PCR-SSCP) analysis. CVM gene of dairy cow was amplified 109 bp DNA fragment by polymerase chain reaction (PCR) with CVM primers. Four hundred and fifty eight blood samples of dairy cow from one dairy farm in south Taiwan were genotyped for CVM with the PCR-SSCP method. The frequencies of carrier (CV, heterozygote) and normal (TV, test free of CVM) were 5.5% (25/458) and 94.5% (433/458), respectively. No affect of bovine complex vertebral malformation cattle was detected. There are 11.4% of 856 Holstein dairy cows from Taiwan Dairy Herd Improvement (DHI) were detected as carrier of CVM and no homozygous recessive animal was detected. In the study, we developed a polymerase chain reaction-single strand conformation polymorphism (PCR-SSCP) analysis for detecting single nucleotide mutations in the candidate genes for CVM, and it was recorded as a first documentation of this genetic deficiency in Taiwan.

Key Words: Dairy cattle, Complex vertebral malformation(CVM), Inherited deficiency, Single-strand conformation polymorphism(SSCP)

**畜產試驗所高產蛋土雞品系CM之微衛星遺傳標記多樣性分析**

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畜產試驗所高產蛋品系CM係以畜試土雞台畜一號近親品系L12公雞與配商用褐色蛋雞母雞雜交一代為基礎族群，進行6個世代自交與產蛋數選育所育成的品系。為評估高產蛋品系CM選育族群的遺傳變異，本試驗利用FAO(2004)建議使用的23組雞微衛星標記組，以及LEI0258微衛星標記組，共24組微衛星標記組分析該族群候選種雞80隻之個體DNA。所有微衛星標記組皆有檢測出多態型的基因型。共檢測到80個對偶基因，平均每個基因座具有3.3個對偶基因(1~7個)，其期望異質度介於0.013到0.701，平均為0.51，觀測異質度介於0到0.738，平均為0.49，而多態性訊息含量平均為0.44。在選用的24組微衛星標記組中有11組呈現高度多態性資訊(PIC ≥ 0.5)，有10組呈現中度多態性資訊(0.5> PIC ≥ 0.25)，3組呈現低度多態性資訊(PIC
關鍵語：土雞、遺傳多樣性、微衞星標記

GENETIC DIVERSITY ANALYSIS OF HIGH EGG PRODUCTION LINE CM NATIVE CHICKEN IN LRI-COA BY MICROSATELLITE MARKERS

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LRI high egg production line CM native chicken, which was selected for numbers of egg

based on the F1 population crossed by the cocks of inbreeding line L12 native chicken of Council of Agriculture Livestock Research LRI and hens of commercial brown layer for six generation self-cross. To assess the genetic variability of high egg production line CM breeding populations, we use a set of 24 microsatellite markers to analyze 80 candidate bred chickens from this flock. All of the microsatellites were polymorphic. The average allelic number was 3.3, ranged from 2 to 7 per locus. The expected heterozygosity ranged from 0.013 to 0.701, and the average expected heterozygosity was 0.51±0.19 (mean ±SD). The observed heterozygosity of the population ranged from 0 to 0.738, and the average observed heterozygosity was 0.49±0.22. The estimated average polymorphic information content (PIC) was 0.44±0.18. In 24 markers, eleven markers were highly informative with polymorphism information content (PIC ≥0. 50), ten markers were reasonably informative (0.5> PIC≥ 0.25) and the other three markers were slightly informative (PIC
Key Words: Native chicken, Genetic diversity, Microsatellite marker

**畜產試驗所高產蛋土雞品系CM產蛋性能分析**

畜產試驗所高產蛋土雞品系CM產蛋性能分析

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為評估引入褐色蛋雞來改良土雞產蛋性能的可行性。以畜試土雞台畜一號近親品系L12公雞與配商用褐色蛋雞母雞之雜交一代為基礎族群，進行6個世代自交與產蛋數選育，育成高產蛋土雞品系CM。G0世代近親品系L12母雞之產第1個蛋的平均產蛋日齡、平均體重及平均蛋重分別為171天、1,696公克及32.8公克，G6世代品系CM母雞則分別為139天、1,767公克及35.9公克，世代間皆存在顯著性的差異(P
關鍵語：土雞、產蛋性能、選育

ANALYSIS OF EGG PRODUCTION PERFORMANCE IN LRI-COA NATIVE CHICKEN LINE CM

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To assess the feasibility of introducing commercial brown layers to improve egg production performance of native chicken. LRI high egg production line CM native chicken, which were selected for egg number based on the F1 population crossed cock of inbreeding line L12 native chicken of Council of Agriculture Livestock Research LRI with hen of commercial brown layer for six generation self-cross. After six generations of selection for egg number production, there were significant differences of the age at first egg(AFE), body weight at first egg(BWAFE), body weight at 40 weeks(BW40), Egg weight at 40 weeks(EW40), number of eggs laid up to 40 weeks of age(EN40) were detected among the generations(P

Key Words: Native chicken, Egg production performance, Selection

**畜試土雞高產蛋品系L7之微衛星遺傳標記多樣性分析**

畜試土雞高產蛋品系L7之微衛星遺傳標記多樣性分析

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畜試土雞高產蛋品系L7係以行政院農業委員會畜產試驗所畜試土雞台畜一號近親品系L7為基礎族群, 進行6個世代產蛋數選育所育成的品系。為評估高產蛋品系L7選育族群的遺傳變異, 本試驗利用FAO(2004)建議使用的23組雞微衛星標記組, 以及LEI0258微衛星標記組, 共24組微衛星標記組分析該族群候選種雞80隻之個體DNA。其中除MCW0216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23組微衛星標記皆有多態型的基因型。共檢測到80個對偶基因, 平均每個基因座具有3.3個對偶基因(1~7個), 其期望異質度介於0到0.737, 平均為0.42, 觀測異質度介於0到0.850, 平均為0.42, 而多態性訊息含量平均為0.37。在選用的24組微衛星標記組中有7組呈現高度多態性資訊(PIC ≥ 0.5), 有11組呈現中度多態性資訊(0.5> PIC ≥ 0.25), 6組呈現低度多態性資訊(PIC
關鍵語：土雞、遺傳多樣性、微衞星標記

GENETIC DIVERSITY ANALYSIS OF HIGH EGG PRODUCTION LINE L7 NATIVE CHICKEN IN LRI-COA BY MICROSATELLITE MARKERS

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LRI high egg production line L7 native chicken, which was selected for number of egg based on the inbreeding line L7 native chicken of Council of Agriculture Livestock Research LRI for six generation. To assess the genetic variability of high egg production line L7 breeding population, we use a set of 24 microsatellite markers to analyze 80 candidate bred chickens from this flock. Except MCW0216, all the microsatellites were polymorphic. The average allelic number was 3.3, ranged from 1 to 7 per locus. The expected heterozygosity ranged from 0 to 0.737, and the average expected heterozygosity was 0.42±0.19 (mean ±SD). The observed heterozygosity of the population ranged from 0 to 0.850, and the average observed heterozygosity was 0.42±0.23. The estimated average polymorphic information content (PIC) was 0.37±0.17. In 24 markers, seven markers were highly informative with polymorphism information content (PIC ≥0. 50), eleven markers were reasonably informative (0.5> PIC≥ 0.25) and the other six markers were slightly informative (PIC

Key Words: Native chicken, Genetic diversity, Microsatellite marker

**純種豬檢定之同胎公豬生長性狀整齊度研究**

純種豬檢定之同胎公豬生長性狀整齊度研究

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血統登錄的純種杜洛克、藍瑞斯及約克夏品種之仔公豬於新化檢定站進行生長性能檢定。開檢體重為40公斤，完檢體重為110公斤，180日齡前須完檢。檢定期間之日增重及飼料效率為實測值，完檢三點背部脂肪厚度平均並矯正至110公斤體重。於2005年起之選拔指數公式，分別是杜洛克品種用的SI=100 + 120ADG – 55FE – 50BF，與藍瑞斯及約克夏品種用的SI=100 + 140ADG – 60FE – 30BF。完檢公豬之選拔指數為100以上的，取得血統登錄號及產肉能力登錄號，視為檢定合格豬。仔公豬送檢時，一胎2頭或4頭進站，故檢定合格登錄頭數為0、2或4頭之胎數所占百分比，可作為遺傳表現之生長性狀整齊度指標。檢定合格登錄公豬是來自同胎且有3或4頭之比率，在杜洛克品種依其出生年是2010的有7.7%及2013年生的有15.6%；在藍瑞斯品種依其出生年是2010的有3.7%及2013年生的有8.8%；在約克夏品種依其出生年是2010的有3.2%及2013年生的有10.7%。因此，種豬場重視一胎送檢4公之同胎整齊度必要性，是利於其種豬群遺傳改良。純種杜洛克、藍瑞斯及約克夏品種之仔公豬於2010年出生的同胎公豬生長性狀整齊度分別為50.2%、58.8%及44.7%；於2013年出生的同胎公豬生長性狀整齊度分別為60.4%、61.0%及52.8%。根據上述資料，讓種豬場增加每胎送檢公豬頭數或全胎檢定結果，可作為各品種內選拔品系性能變異度降低之依循用。

關鍵語：種豬、選育、生長性狀

STUDY ON GROWTH TRAIT UNIFORMITY OF LITTERMATE BOARS UNDER SWINE PUREBRED PERFORMANCE TEST

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Purebred Duroc, Yorkshire and Landrace boars with registered parent(s) were performance tested at Hsinhua Station. The starting weight for the test set around 40 kg and off-tested on the weight of 110 kg or by 180 days of age during all test periods. The average daily gain, feed efficiency and back fat thickness of boars were recorded and evaluated as a contemporary group deviation to the mean of each breed for selection index calculation purposes. Selection index of 2005 version for Duroc was SI=100 + 120ADG – 55FE – 50BF, and for Landrace and Yorkshire was SI=100 + 140ADG – 60FE – 30BF. Off-tested boars with selection index 100 or above were then giving both pedigree registration (PR) and growth performance registration (GR). Each litter should have 2 or 4 littermate boars in test, therefore, percentage of litters having 0, 2 or 4 littermate boars with GR could be designated as growth trait uniformity. In those of GR Duroc boars,

percentage of litter with 3 or 4 littermates were 7.7% of year 2010 born and 15.6% of year 2013 born. In Landrace, there were 3.7% of year 2010 born and 8.8% of year 2013 born. In Yorkshire, there were 3.2% of year 2010 born and 10.7% of year 2013 born. Swine breeder farms accepted the essential key to improve stock performance by focusing on littermate uniformity. In year 2010 born boars, there were 50.2%, 58.8% and 44.7% of growth trait uniformity in Duroc, Landrace and Yorkshire, respectively. In year 2013 born boars, there were 60.4%, 61.0% and 52.8% of growth trait uniformity in Duroc, Landrace and Yorkshire, respectively. Based upon results, an increase of littermate boars or whole litter for the test would be served as a guideline for variation reduction of selected lines within breed in each breeding farm.

Key Words: Breeding pig, Selection, Growth trait.

**努比亞種羊黏多醣症與肉質相關基因之基因型分析**

努比亞種羊黏多醣症與肉質相關基因之基因型分析

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本試驗之目的為利用PCR-RFLP 或PCR-SSCP方法, 對來自東台灣的種羊場28頭與南部的種羊場75頭努比亞種羊, 進行黏多醣症(Mucopolysaccharidosis,G6S) 及肉質相關基因腦下垂體特異性轉錄因子(pituitary transcription factor, POU1F1) 與鈣蛋白酶抑制蛋白 (Calpastatin, CAST) 基因之基因型分析。初步結果, G6S基因型有正常型AA與雜合型AB兩種, AB頻率為0.10 (1/103), 而南部的種羊場努比亞種羊皆為正常型。POU1F1是依照NCBI的DQ826413 DNA序列設計一對引子, 去PCR增殖努比亞種羊DNA, 得到481 bp片斷, 再用AluI 限制酶切割, 可分出CC 與TC 基因型, 其頻率分別為0.79 與0.21。而依照Zhou et al. (2008) 設計之一對引子增殖努比亞種羊DNA, 得到全長253或254 bp之CAST片段, 再進行SSCP分析, 可分出A, B及C態樣, 其頻率分別為0.77、0.13及0.10。以上結果可供努比亞種羊場進行G6S-AA型培育與未來努比亞種羊肉質基因選種之參考。

關鍵語：努比亞種羊、肉質基因、黏多醣症

GENOTYPING OF MUCOPOLYSARCHARIDOSIS AND GENES IN ASSOCIATION WITH MEAT QUALITY FOR NUBIAN GOAT

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The aim of this study was to detect the genotypes of Mucopolysaccharidosis and genes in association with meat quality for Nubian goat. Totally 103 genomic DNA samples were

collected from two goat farms located in eastern Taiwan and southern Taiwan for defining the genotype of (Mucopolysaccharidosis, G6S), (pituitary transcription factor, POU1F1), and (Calpastatin, CAST) genes by PCR-RFLP or by PCR-SSCP method. Genotyping frequencies of each gene for Nubian goat were analyzed. The preliminary results, there were two G6S genotypes, normal type AA and heterozygous type AB. The frequency for AB type was 0.10 (1/103), and all 75 Nubian goats were normal from farm located in southern Taiwan. According to DQ826413 DNA sequence of NCBI, we designed a pair primer for POU1F1 gene to amplify Nubian DNA by PCR, and got the 481 bp products, then digested with AluI restriction enzyme. The POU1F1 genotype frequencies of CC , and CT were 0.79 and 0.21, respectively. And we used a pair primer designed by Zhou et al. (2007) for CAST gene to amplify Nubian DNA by PCR, and got the 253 or 254 bp products, then genotyped by SSCP analysis. The SSCP analysis of CAST gene constituted three different genotypes, A, B and C. The CAST genotype frequencies of A, B and C were 0.77, 0.13 and 0.10, respectively. The results are potentially useful for Nubian goat farmer to breed G6S-AA type goat and to get good meat quality by gene selection in the future.

Key Words: Nubean goat, Meat quality gene, Mucopolysaccharidosis

**種豬粒線體DNA D環區序列之分析**

種豬粒線體DNA D環區序列之分析

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本研究之目的在於探討三個品種選拔指數不小於110之種豬粒線體部分D環區序列之變異，藉以瞭解品種間與品種內之差異。試驗樣品總計有190頭種豬之粒線體DNA，包括64頭杜洛克豬、63頭藍瑞斯豬及63頭約克夏豬。設計D環區特定引子對，用以PCR增幅特定片段，產物純化後進行DNA序列解析，所有DNA序列經過多重比對分析後，在557 bp的DNA序列範圍內發現了26個變異點，大部分之變異型式為T/C（17點），其餘有A/G（7點），A/T（1點)及C缺失(1點)。在三個豬種裡，約克夏豬具有最多的變異點25個，其次為杜洛克豬19點，最少為藍瑞斯豬13點。在類緣演化分析中顯示，某些群叢包含了兩個品種以上的豬隻樣品，由此可再進一步探討可能的原因。

關鍵語：粒線體DNA D環區、變異點、種豬

SEQUENCE VARIATION ANALYSIS OF MITOCHONDRIAL DNA D-LOOP REGION OF BREEDING PIGS

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The aim of this study was to investigate the sequence variation of mitochondrial DNA D-loop region of and to discover the difference between and within three breeds of breeding pigs with a selection index no less than 110. A total of 190 mtDNA samples from

64 heads of Duroc pigs, 63 heads of Landrace pigs, and 63 heads of Yorkshire pigs were tested. The PCR products were amplified with mtDNA D-loop region specific primers and were purified by a purification kit. After DNA sequencing and multiple alignment of all sequences, 26 variation sites were found in 557-bp DNA segment. Most of the variation type was T/C pattern (17 points), followed by A/G pattern (7 points), A/T pattern (1 point), and C deletion (1 point). Among three breeds of pigs, Yorkshire, Duroc, and Landrace possessed 25, 19, and 13 variation sites, respectively. Based on the phylogenetic analysis, more than two breeds of pigs were found on the same cluster. Therefore, it deserves further study to find possible causes.

Key Words: Mitochondrial DNA D-loop, Variation site, Breeding pig

**畜產試驗所高產蛋土雞品系CM公雞之屠體性狀分析**

畜產試驗所高產蛋土雞品系CM公雞之屠體性狀分析

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行政院農業委員會畜產試驗所育成之土雞高產蛋品系CM，係以畜試土雞近親品系台畜一號L12公雞與配商用褐色蛋雞母雞之雜交一代為基礎族群，經6 個世代自交選育出的高產蛋品系CM。為瞭解品系CM之屠體性能，選留16週齡體重在2.0~2.2公斤的公雞，分別於19週齡與21週齡達2.3公斤以上的公雞進行屠體性狀分析。比較19週齡與21週齡公雞之屠體性狀，平均未去內臟屠體體重、內臟屠體體重、屠宰率及胸腿部佔屠體百分率在兩者間無顯著差異，分別為2240±61公克與2224±98公克、1934±53公克與1936±95公克、78.99%與80.21%及67.72%與67.06%，而胸腿部精肉量佔屠體百分則分別為45.80%與47.24%，且週齡間存在顯著地差異(P
關鍵語：土雞、屠體性狀、高產蛋

STUDY ON CARCASS CHARACTERISTICS FOR ROOSTERS OF HIGH EGG PRODUCTION LINE L11 NATIVE CHICKEN IN LRI-COA

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LRI-COA high egg production line 11 native chickens, which were selected on high egg production for six generation based on the inbreeding line L11 native chicken of Livestock Research Institute, Council of Agriculture(LRI-COA). To study the carcass characteristics of line L11, we use cocks with 1.8~2.0 kg Body weight at 16 weeks of age as experiment animals. Cocks reached 2.0 kg were slaughter at 19 weeks and 21 weeks of age. Comparison of carcass characteristics of the cocks at different weeks of age in this trail, we found there are no significantly different on GCW (gutted carcass weight), DP(dressing percentage) and BTP (breast and thigh as percentage of carcass weight) of cocks in different ages, and the GCW, DP and BTP of cocks at 19 weeks and 21 weeks of age

were 2152±33g and 2076±41g, 82.09% and 82.08%, and 66.43% and 66.37%, respectively. However on NGCW (not gutted carcass weight) (2152±33 g vs. 2076±41 g), Breast as percentage of carcass weight(23.83% vs. 21.20%), thigh as percentage of carcass weight(42.63% vs. 45.17%), there was significant different between 19 and 21 weeks of age (P
Key Words: Native chicken, Carcass characteristics, High egg production

**畜禽精子染色體缺損檢測技術**

畜禽精子染色體缺損檢測技術

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本研究主要目的在建立精子染色體DNA缺損檢測技術並嘗試應用本法作為調查家畜禽物種如豬、鴨、鵝及雞精液染色體DNA缺損之分布情況。染色體DNA缺損使用流式細胞儀分析並計算樣品之DFI ( DNA fragmentation index ) 值, 當DFI值愈高表示樣品DNA受損的程度越高。針對180頭豬、58隻白番鴨、30隻白羅曼鵝及277隻土雞進行試驗分析後, 結果顯示各樣品中其DFI值≦5%, >10%及>20%之樣品占分析頭數百分比分別為豬38.9%, 17.8%及5.6%、白番鴨為55.2%, 20.7%及3.4%、白羅曼鵝分為20%, 26.7%及3.3%及土雞為42.2%, 19.9% 及19.5%。根據上述資料, 家畜禽精子染色體DNA缺損可藉由流式細胞儀進行檢測, 而染色體缺損嚴重者(DFI >20%)在各品種間皆可被觀察到, 因此家畜禽精液品質評估可新增染色體缺損檢測項目, 本法亦可應用於篩除種畜禽場內精子染色體缺損嚴重之個體。

關鍵語：家畜禽、精子、DNA缺損

FRAGMENTATION OF SPERM DNA IN LIVESTOCK

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High standards of semen quality in livestock exploited for animal industry are of economic relevance due to its association with fertility and offspring results. The purpose of this study was to establish and investigate the sperm DNA fragmentation index (DFI) which could be considered normal in livestock such as boar, duck, gooses and chicken. Ejaculates of 180 boar, 58 white Muscovy ducks, 30 white Roman gooses and 277 Native Chicken were analysed and it ' s DFI values were calculated by Flow cytometry. The result showed that DFI≦5% among species were 38.9%, 55.2%, 20% and 42.2%; DFI >10% were 17.8%, 20.7%, 26.7% and 19.9% and DFI>20% were 5.6%, 3.4%, 3.3% and 19.5%. An incidence of ejaculates with a DFI higher than 20% has been observed in all species suggest that adding sperm DNA fragmentation as a new parameter to the routine assessment of every ejaculate may be beneficial to the field and the sperm DFI values could be an useful

reference in extrusion of breeding animals.

Key Words: Livestock, Sperm, DNA fragmentation

**臺灣杜洛克與杜洛克背最長肌脂肪酸組成之比較**

臺灣杜洛克與杜洛克背最長肌脂肪酸組成之比較

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本試驗旨在分析臺灣杜洛克豬與杜洛克的背最長肌脂肪酸組成，以了解兩個品種在加工屠肉上的差異性。試驗動物選定13頭育種場的R4代臺灣杜洛克豬、12頭LR雜交肉豬、12頭種豬場異地飼養的R5代臺灣杜洛克豬，以及12頭杜洛克，試驗豬隻飼養至110-120公斤即送往肉品冷凍廠以電昏方式屠宰，進行屠體分切，並取回背最長肌，供肉質理化分析用。結果顯示，豬肉內不飽和脂肪酸（unsaturated fatty acid, USFA）以56.56  61.12%的含量高於飽和脂肪酸（saturated fatty acid, SFA）的38.91  43.46%，又單元不飽和脂肪酸（monounsaturated fatty acid, MUFA）以45.31  49.56%的含量高於多元不飽和脂肪酸（polyunsaturated fatty acid, MUFA）的7.20  15.81%。豬背最長肌中的USFA含量高於SFA含量，又USFA中以油酸（oleic acid, C18:1）所佔比例最高，亞麻油酸（linoleic acid, C18:2）次之；而SFA中以棕櫚酸（palmitic acid, C16:0） 所佔比例最高，硬脂酸（stearic acid, C18:0）次之。比較臺灣杜洛克與杜洛克差異，臺灣杜洛克R5代背最長肌以USFA與PUFA最高，杜洛克則以SFA與MUFA最高，顯示臺灣杜洛克豬是健康的食肉來源，但杜洛克在加工產品的穩定性較高。

關鍵語：脂肪酸、背最長肌、臺灣杜洛克

COMPARISON ON THE FATTY ACID COMPOSITION OF LONGISSIMUS DORSI BETWEEN THE TAIWAN DUROC AND DUROC

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The purpose of this study was to investigate the difference on fatty acid composition of longissimus dorsi between the Taiwan Duroc and Duroc. Taiwan Duroc of R4 from swine breeding farm (n = 13), LR market pig (n = 12), Taiwan Duroc of R5 housed off-site, and Duroc (n = 12) were sacrificed to analyze the physical and chemical characteristics of longissimus dorsi when body weight reached 110 to 120 kg. The results showed that the pork had higher content of unsaturated fatty acid (USFA; 55.56 ~ 61.12%) than those of saturated fatty acid (SFA; 38.91 ~ 43.46%). Of the USFA, approximately 45.31 to 49.56% was monounsaturated fatty acid (MUFA) and 7.20 to 15.81% was polyunsaturated fatty acid (PUFA). The results also showed that the USFA content was higher than SFA in longissimus dorsi. Among USFA, the oleic acid (C18:1) was the highest USFA followed by linoleic acid (C18:2), and among SFA, the palmitic acid (C16:0) was the highest SFA and stearic acid (C18:0) was second. Moreover, following comparison of fatty acid composition, the Taiwan

Duroc of R5 had the highest USFA and PUFA in longissimus dorsi, whereas the Duroc had the highest SFA and MUFA. These results reveal that the Taiwan Duroc pork is a better source of meat, but Duroc pork had more stability during meat processing.

Key Words: Fatty acid, Longissimus dorsi, Taiwan Duroc

**臺灣杜洛克公豬繁殖性能之評估**

臺灣杜洛克公豬繁殖性能之評估

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為評估臺灣杜洛克不同世代公豬繁殖性能，本試驗選定R2~R5代臺灣杜洛克公豬與藍瑞斯母豬（L；12頭取自畜產試驗所育種場、9頭取自民間肉豬場）、藍瑞斯與約克夏之雜交母豬（LY；6頭）、黑豬場之桃園豬（T；2頭）、桃園豬♀與梅山豬♂之雜交母豬（T×M；2頭）、桃園豬♀與大黑豬之雜交母豬（T×B；1頭），及梅山豬♀與大黑豬♂之雜交母豬（M×B；1頭）進行雜交試驗。試驗將母豬分成洋豬與黑豬，各別評估繁殖性能。結果顯示，臺灣杜洛克R2公豬與配L與LY母豬在育種場與肉豬場的出生窩仔數分別為11.33 ± 3.06與12.00 ± 1.73頭，出生活仔數10.00 ± 2.65與10.33 ± 0.58頭；R3代公豬與配L與LY母豬在育種場與肉豬場出生窩仔數分別9.0 ± 0.00與8.67 ± 1.53頭，出生活仔數9.00 ± 0.00與8.33 ± 1.53頭；R4與R5代公豬與配L與LY母豬僅收集肉豬場結果，出生窩仔數分別為11.33 ± 3.06與9.00 ± 4.24頭，出生活仔數11.33 ± 3.06與8.00 ± 5.66頭。R3與R4代公豬與配雜交黑母豬繁殖性能，出生窩仔數為7.00 ± 1.73與8.67 ± 4.04頭，出生活仔數為7.00 ± 1.73與8.33 ± 4.16頭。試驗結果顯示，臺灣杜洛克公豬以R2與R4代公豬表現較佳，因收集胎數較少，未來將持續收集資料評估公豬的繁殖性能。

關鍵語：臺灣杜洛克、繁殖、公豬

EVALUATION ON REPRODUCTIVE PERFORMANCE OF TAIWAN DUROC BOAR

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In order to evaluate the reproductive performance of the Taiwan Duroc boars at various generations, the Taiwan Duroc boars of generation R2 to R5 were mated with sows of Landrace (L) from swine breeding farm of Livestock Research Institute (LRI; n = 12) and pig farms (n = 6), Taoyuan black pig (T; n = 2), and sows of Landrace × Yorkshire (LY; n=6), Taoyuan♀× Meishan♂ (T × M; n = 2), Taoyuan ♀ × Large black pig ♂ (T × M; n = 1), and Meishan♀ × Large black pig♂ (M × B; n = 1), respectively. The sows were further divided into exotic and black pigs for evaluating the reproductive performance of the Taiwan Duroc boars. The results showed that litter size at birth and piglet born alive in the LRI breeding farm and pig farm were, respectively, 11.33 ± 3.06 and 12.00

± 1.73, and 10.00 ± 2.65 and 10.33 ± 0.58 when mated the Taiwan Duroc boars of R2 with sows of L and LY. The litter size at birth and piglet born alive in the LRI breeding farm and pig farm were, respectively, 9.00 ± 0.00 and 8.67 ± 1.53, and 9.00 ± 0.00 and 8.33 ± 1.53 when mated the Taiwan Duroc boars of R3 with sows of L and LY. The litter size at birth and piglet born alive in pig farms were 11.33 ± 3.06 and 9.00 ± 4.24, and 11.33 ± 3.06 and 8.00 ± 5.66 when mated the Taiwan Duroc boars of R4 and R5 with sows of L and LY, respectively. Moreover, the litter size at birth and piglet born alive were 7.00 ± 1.73 and 8.67 ± 4.04, and 7.00 ± 1.73 and 8.33 ± 4.16 when mated the Taiwan Duroc boars of R3 and R4 with sows of black pig, respectively. From these results reveals the Taiwan Duroc boars of R2 and R4 had better reproductive performance than those of other generations. Continually to collect records is required for accurate evaluation of reproductive performance in the Taiwan Duroc boars.

Key Words: Taiwan Duroc, Reproductive Performance, Boar

**臺灣杜洛克與其它品種屠體性能之比較**

臺灣杜洛克與其它品種屠體性能之比較

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杜洛克種豬以生長、屠體及肉質性能佳為特色，本試驗選育目標為培育繁殖性能優良的新品種，具杜洛克外觀、多產與肉質基因的臺灣杜洛克新品種。試驗評估臺灣杜洛克各世代及其它品種閹公豬與女豬的屠體性能，本試驗共屠宰3種豬隻品種，包括臺灣杜洛克豬，其又分成取自育種場（共19頭；10頭閹公豬與9頭女豬）或民間種豬場（共12頭；6頭閹公豬與6頭女豬）、育種場雜交肉豬 LR（L♀ × R♂）（共25頭；16頭閹公豬與9頭女豬），及民間種豬場提供的純種杜洛克（共12頭；閹公豬8頭與女豬4頭）。試驗結果顯示，各品種平均脂肪率約8 10%，瘦肉率以R4代閹公豬的54.16%與LR雜交品種女豬的53.03%最高；背脂厚度以R5代閹公豬的1.63公分與杜洛克女豬1.33公分最低；腰眼面積以杜洛克閹公豬58.40平方公分與R5代女豬的68.87平方公分最高，且腰眼面積與屠體重有顯著正相關。屠體長在閹公豬與女豬皆以LR雜交品種的105公分最長，其次是R4代閹公豬102.40公分。

關鍵語：臺灣杜洛克、屠體性能、閹公豬

COMPARISON ON CARCASS TRAITS IN TAIWAN DUROC AND OTHER PIG BREEDS

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High carcass yield and meat quality, and the ability to grow quickly were characteristics Duroc possessed. The breeding goal was to develop a new breed with Duroc characteristics, prolific and high-quality meat genes. The carcass traits among Duroc and other breeds of

barrow and gilt were compared in this study. Three pig breeds were sacrificed for collecting the carcass traits which includes the Taiwan Duroc from the swine breeding farm (10 barrows and 9 gilts) and pig farms (6 barrows and 6 gilts), LR pig (L♀ × R♂) from the swine breeding farm (16 barrows and 9 gilts), and pure Duroc from pig farms (8 barrows and 4 gilts). The results showed that average of fat percentage was 8 to 10 % among these three breeds. The highest percentage of lean was 54.16% and 53.03% in barrows of R4 and gilts of LR, respectively. The lowest backfat thickness was 1.63 and 1.33 cm in barrows of R5 and gilts of Duroc, respectively. The longest loin eye area was 58.40 and 68.87 cm2 in barrows of Duroc and gilts of R5, respectively. Moreover, the longest carcass length was 105 cm either in barrows or gilts of LR, followed by barrows of R4 which carcass length was 102.40 cm.

Key Words: Taiwan Duroc, Carcass Traits, Barrow

**畜試土雞高產蛋品系L11之微衛星遺傳標記多樣性分析**

畜試土雞高產蛋品系L11之微衛星遺傳標記多樣性分析

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畜試土雞高產蛋品系L11係以行政院農業委員會畜產試驗所畜試土雞台畜一號近親品系L11為基礎族群，進行6個世代產蛋數選育所育成的品系。為評估高產蛋品系L11選育族群的遺傳變異，本試驗利用FAO(2004)建議使用的23組雞微衛星標記組，以及LEI0258微衛星標記組，共24組微衛星標記組分析該族群候選種雞80隻之個體DNA。其中除MCW0216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23組微衛星標記皆有多態型的基因型。共檢測到80個對偶基因，平均每個基因座具有3.5個對偶基因(1~11個)，其期望異質度介於0到0.829，平均為0.49，觀測異質度介於0到0.888，平均為0.44，而多態性訊息含量平均為0.43。在選用的24組微衛星標記組中有11組呈現高度多態性資訊(PIC ≥ 0.5)，有8組呈現中度多態性資訊(0.5> PIC ≥ 0.25)，5組呈現低度多態性資訊(PIC
關鍵語：土雞、遺傳多樣性、微衞星標記

GENETIC DIVERSITY ANALYSIS OF HIGH EGG PRODUCTION LINE L11 NATIVE CHICKEN IN LRI-COA BY MICROSATELLITE MARKERS

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LRI high egg production line L11 native chicken, which was selected for number of eggs based on the inbreeding line L11 native chicken of Council of Agriculture Livestock Research LRI for six generation. To assess the genetic variability of high egg production line L11 breeding population, we use a set of 24 microsatellite markers to analyze 80 candidate bred chickens from this flock. Except MCW0216, all the microsatellites were

polymorphic. The average allelic number was 3.5, ranged from 1 to 11 per locus. The expected heterozygosity ranged from 0 to 0.829, and the average expected heterozygosity was 0.49±0.25 (mean ±SD). The observed heterozygosity of the population ranged from 0 to 0.888, and the average observed heterozygosity was 0.44±0.25. The estimated average polymorphic information content (PIC) was 0.43±0.23. In 24 markers, eleven markers were highly informative with polymorphism information content (PIC ≥0.50), eight markers were reasonably informative (0.5>PIC≥0.25) and the other five markers were slightly informative (PIC
Key Words: Native chicken, Genetic diversity, Microsatellite marker

**畜試土雞高產蛋選育族群執行雛白痢清除計畫之評估**

畜試土雞高產蛋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。本試驗之目的為評估建立雛白痢清除之畜試土雞高產蛋選育族群的可行性，期望能提升雞群育成率及整齊度，進而增加生產效益。配合畜試土雞高產蛋選育族群，各世代候選種雞於17至18週齡時採集翼靜脈血液約1-2mL，進行雛白痢平板凝集試驗，陽性雞隻淘汰不作種用。G1至G3世代雞隻血樣是以同一進口雛白痢診斷試劑檢測，自第G4世代起檢測試劑改用家畜衛生試驗所研發之雛白痢診斷試劑。檢測結果雛白痢陽性率G1、G2、G3、G4、G5、G6、G7及G8世代分別為18.16%(219/1,206)、1.99%(12/602)、2.94%(28/951)、19.24%(152/790)、5.81%(41/706)、15.08%(162/1,074)、0%(0/557)及0%(0/573)，畜試土雞高產蛋選育族群G7與G8世代之所有候選種雞皆為雛白痢陰性反應，結果顯示應用淘汰雛白痢陽性雞隻不作種用的選育方法確實可降低雞群雛白痢陽性率。

關鍵語：土雞、雛白痢、血清平板凝集反應

EVALUATION OF POLLORUM DISEASE ELIMINATION IN HIGH EGG PRODUCTION SELECTION BREEDING FLOCKS OF NATIVE CHICKEN IN LRI-COA

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Pullorum disease, caused by Salmonella pullorum, is mainly spread by horizontal transmission or infected eggs. Acute outbreaks occur in farms quit often, and the affected chicken become no symptomatic carriers and infects the chicks via eggs. Therefore, eliminating the pullorum disease remains an important issue in poultry industry. The purpose of this trial is to evaluate the feasibility of establishing a

pullorum disease test free breeding flocks in high egg production lines of LRI native chicken. Blood samples, 1 to 2 mL, collected from wing veins about of 15 to 20 week-old candidate bred chickens in each generation, and then assayed in rapid serum plate agglutination (SPA) test. All the positive birds will be eliminated. Positive rate of pullorum disease in G1, G2, G3, G4, G5, G6, G7 and G8 were 18.16%(219/1,206), 1.99%(12/602), 2.94%(28/951), 19.24% (152/790), 5.81%(41/706), 15.08%(162/1,074), 0%(0/557) and 0%(0/573), respectively. All of the candidate bred chickens were negative in serological diagnosis of pullorum disease. The result shows the selection method to eliminate candidate bred chickens with positive reaction of pullorum disease from breeding flocks could be useful to reduce the positive rate of pullorum disease in chicken flocks.

Key Words: Native chicken, Pullorum disease, Serum plate agglutination

**畜試土雞高產蛋品系L11產蛋性能改進**

畜試土雞高產蛋品系L11產蛋性能改進

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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。行政院農業委員會畜產試驗所以畜試土雞台畜一號近親品系L11族群進行高產蛋數選育，經6個世代對產蛋數的選育，G0世代母雞之產第1個蛋的平均產第1個蛋的日齡、平均體重及平均蛋重分別為155天、1,567公克及29.8公克，G6世代母雞則分別為134天、1,788公克及30.6公克，世代間皆存在顯著性的差異(P
關鍵語：土雞、產蛋性能、選育

IMPROVEMENT OF EGG PRODUCTION PERFORMANCE IN LRI NATIVE CHICKEN LINE L11

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In order to establish the platform for improve egg production performance in native chicken. High number of eggs hens were selected for breeding from inbreeding lines L11 of Livestock Research Institute. After six generations of selection for number of eggs production, there were significant differences of the age at first egg(AFE), body weight at first egg(BWAFE), body weight at 40 weeks(BW40), Egg weight at 40 weeks(EW40), number of eggs laid up to 40 weeks of age (EN40) were detected among the generations(P
Key Words: Native chicken, Egg production performance, Selection

**畜試土雞高產蛋品系L11公雞屠體性狀分析**

畜試土雞高產蛋品系L11公雞屠體性狀分析

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畜試土雞高產蛋品系L11係以行政院農業委員會畜產試驗所畜試土雞台畜一號近親品系L11為基礎族群，進行6個世代產蛋數選育所育成的品系。為瞭解品系L11之屠體性能，選留16週齡體重在1.8~2.0公斤的公雞，分別於19週齡與21週齡達2.0公斤以上的公雞進行屠體性狀分析。比較19週齡與21週齡公雞之屠體性狀，去內臟屠體體重、屠宰率及胸腿部佔屠體百分率在兩者間無顯著差異，分別為2152±33公克與2076±41公克、82.09%與82.08%及66.43%與66.37%。而平均未去內臟屠體體重、胸部佔屠體百分率、腿部佔屠體百分率在週齡間存在顯著地差異(P
關鍵語：土雞、屠體性狀、高產蛋

STUDY ON CARCASS CHARACTERISTICS FOR ROOSTERS OF HIGH EGG PRODUCTION LINE L11 NATIVE CHICKEN IN LRI-COA

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LRI-COA high egg production line 11 native chickens, which were selected on high egg production for six generation based on the inbreeding line L11 native chicken of Livestock Research Institute, Council of Agriculture(LRI-COA). To study the carcass characteristics of line L11, we use cocks with 1.8~2.0 kg Body weight at 16 weeks of age as experiment animals. Cocks reached 2.0 kg were slaughter at 19 weeks and 21 weeks of age. Comparison of carcass characteristics of the cocks at different weeks of age in this trail, we found there are no significantly different on GCW (gutted carcass weight), DP(dressing percentage) and BTP (breast and thigh as percentage of carcass weight) of cocks in different ages, and the GCW, DP and BTP of cocks at 19 weeks and 21 weeks of age were 2152±33g and 2076±41g, 82.09% and 82.08%, and 66.43% and 66.37%, respectively. However on NGCW (not gutted carcass weight) (2152±33 g vs. 2076±41 g), Breast as percentage of carcass weight(23.83% vs. 21.20%), thigh as percentage of carcass weight(42.63% vs. 45.17%), there was significant different between 19 and 21 weeks of age (P
Key Words: Native chicken, Carcass characteristics, High egg production

**天噸乳牛之飼養地區及其雌親上四代乳量**

天噸乳牛之飼養地區及其雌親上四代乳量

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天噸乳牛是指一頭泌乳牛在台灣濕熱氣候下，自開始測乳後的平均每一個泌乳期(305-2X-ME)就能夠生產牛奶超過10,000公斤以上的乳量，亦就是年產乳量有10公噸以上，10公噸的英文是Ten Tons，取其音取其義，我們稱這種乳牛為天噸乳牛(Ten Tons Cow)。自2001年以來，累計有5,742頭，其中900頭具有其雌親三代以上系譜，飼養天噸牛10頭數以上的七個地區有彰化28戶458頭、台南23戶234頭、嘉義19戶71頭、高雄9戶42頭、屏東15戶31頭、雲林8戶23頭及桃園3戶17頭，占97.3%(876/900)。選取2014年還在測乳的天噸牛隻366頭，比較有雌親上四代系譜或僅上三代系譜之天噸牛乳量，有上四代系譜224頭天噸牛乳量平均為10,736Kg，其雌親上一至四代乳量平均依序有9,604、9,423、9,065及9,009Kg；而僅上三代系譜142頭天噸牛乳量平均為10,718Kg，其雌親上一至三代乳量平均依序有9,616、9,239及8,961Kg。選取雌親上四代均有乳量紀錄之27頭天噸牛乳量平均為10,846Kg，其雌親上一至四代乳量平均依序有10,080、9,738、9,265及8,934Kg，顯示依據雌親系譜及乳量選留已逐代改進台灣乳牛群性能。

關鍵語：乳牛、選育、乳質

FARMING COUNTY OF TEN TONS COW AND THEIR MATERNAL MILK YIELD IN UPWARD FOUR GENERATIONS

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Ten Tons Cow is designated as milk yield of 305-2X-ME greater than 10,000 kg for hot and humid environment in Taiwan. For breeding scheme of dairy cattle, selection on milk yield and quality associated with reproductive performance is essential to the hot and humid weather. A total of 5,742 Ten Tons Cow was recorded from year 2001 to October of 2014. Among of them, there are 900 head with maternal pedigree in upward three or more generation. Farming county had at least 10 head were Changhua with 458 head in 28 farms, Tainan with 234 head in 23 farms, Chiayi with 71 head in 19 farms, Kaohsiung with 42 head in 9 farms, Pingtung with 31 head in 15 farms, Yunlin with 23 head in 8 farms, and Taoyuan with 17 head in 3 farms, in which were 97.3% (876/900) of 900 Ten Tons Cow. Selection of 366 cows with measured milk yield in 2014 is used for comparison on milk yield between cows either with upward four or three generations. Cows of 224 head with upward four generation had 10,736Kg of milk yield and their maternal upward from one to four generation had 9,604, 9,423, 9,065 and 9,009Kg of milk yield, respectively. Cows of 142 head with upward only three generation had 10,718Kg of milk yield and their maternal upward from one to three generation had 9,616, 9,239 and 8,961Kg of milk yield, respectively. Cows of 27 head having maternal milk yield in upward four generations, they had 10,846Kg of milk yield and their maternal upward from one to four generation had 10,080, 9,738, 9,265 and 8,934Kg of milk yield, respectively. Based upon maternal milk yield and pedigree to select heifer in dairy herds, it indicated that milk performance of dairy cows in Taiwan could be improved in generations.

Key Words: Dairy cattle, Selection, Milk quality