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種公豬繁殖性能場內檢定及認證

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### 種公豬繁殖性能場內檢定及認證

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台灣區種豬產業協會所屬21家會員場實施種公豬採精性狀檢定及認證，95年度從9501期至9507期等7期，計檢定認證杜洛克275頭，藍瑞斯88頭，約克夏18頭。各場在公豬採精檢定前均曾試教爬假母臺，因此各品種駕乘意願均高，後肢強度均正常。以陰莖長度檢驗精液量、精蟲濃度與活力的相關，結果無顯著。精液採集量在杜洛克品種多分佈於100毫升至150毫升間，藍瑞斯在200毫升左右，亦有高達500毫升者。以精液性狀標準鏡檢經各種豬場精選之受檢豬，有5.1%的杜洛克與2.3%的藍瑞斯，被檢出因精子活力低或死精而無受精能力。比94年度(9405至9408期)的12.3%的杜洛克公豬與10.3%的藍瑞斯公豬，出場拍賣公豬繁殖性能已有進步，目測狀況下仍有精液稀薄或無精狀況有5.1%的杜洛克與2.3%的藍瑞斯，亦比94年度的12.3%與18%改進很多，陰莖外觀異常在杜洛克檢出2.2%。種公豬拍賣平均售價以採精認證的前一年度(9304期至9403期)與有採精認證的這一年半期間(9404期至9507期)比較，發現每頭杜洛克減少6,298元，但每頭藍瑞斯與約克夏分別提高4,127元與4,363元銷售價。

關鍵語：種公豬、繁殖性能

On-farm test for reproductive performance of boars and its application

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Participants of on-farm test for reproductive performance (OTRP) of boars were 21 breeding farms, member of Formosan Industry Association for Swine Improvement (FIASI). The young boars were eight to ten months old and tested free of porcine stress syndrome (PSS) provided by members of FIASI for the public auction. Boars tested in the period from 7 to 21 days before the public auction depend on the schedule arranged by the association. In total, there were 7 times auctions and 275 Durocs, 88 Landraces and 18 Yorkshires were certified for the semen characteristics. The results showed 5.1% Duroc and 2.3% Landrace had sperm motility problem, and 1.8% Duroc and 5.7% Landrace had trouble on low sperm concentration. Only Duroc had the weakness of penis deformity with a frequency of 2.2%. No significant associations were detected for penis length with semen volume or with semen quality. The average boar auction price of before and after OTRP practice were -6,298 NT dollars difference for Duroc, but were + 4,127 dollars and + 4,363 dollars for Landrace and Yorkshire.

Key Words: boar, Reproductive performance

娟珊牛在台灣夏季的乳量與乳質表現

## 42. 娟珊牛在台灣夏季的乳量與乳質表現

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娟珊牛在台灣濕熱氣候下，並在台灣乳牛養管系統中進胎第一胎乳表現，其夏季月份的乳量與乳質表現需即時評估。乳牛育種策向上，期望以乳量、乳質及繁殖性兼顧的選拔為主，培育台灣乳牛具有適應濕熱環境的特色，成為乳牛熱帶品系，並出口東南亞國家。因此，本研究從DHI資料庫www.angrin.tlri.gov.tw分析五家娟珊牛場於2007年7至10月間，計680頭次乳樣記。娟珊牛單日最高乳量為27 kg(2006年台灣乳牛記為63 kg)，平均為15.5±4.0 kg(2006年台灣乳牛平均為22.7 kg)。娟珊牛乳脂肪(F)、蛋白質(P)、乳量及總固形物分別有4.69±0.97、3.48±0.40、4.83±0.30及13.71±1.04%。與2006年台灣乳牛218,818乳樣之乳脂肪(3.81%)、蛋白質(3.30%)、乳量及總固形物(4.79%)及(12.59%)平均比較，娟珊牛乳脂肪明顯地較高。娟珊牛體細胞平均達72.2萬細胞/mL，較2006年台灣乳牛體細胞平均32.2萬細胞/mL明顯地較高。娟珊牛乳素氮、檸檬酸、及P/F比為14.4±5.8 mg/dL、190.0±27.9 mg/dL及0.78。當依乳量分為9 kg以下、10~21 kg及22 kg以上等三組，分佈頻數為47(6.9%)、589(86.6%)、44(6.5%)。娟珊牛高乳組的乳量平均為23.2±1.3 kg，其乳脂肪、蛋白質、乳量及總固形物分別有4.48±0.89、3.38±0.20、4.79±0.21及13.36±0.94%，顯示高乳量僅低脂肪。因此，應用乳量乳質兼顧的選拔，也有於娟珊牛群性能之改進。

關鍵語：乳牛、選育、乳質

### MILK YIELD AND QUALITY OF JERSEY COW IN SUMMER SEASON OF TAIWAN

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Jersey (J) cow was raised under a hot and humid environment but they were in the same feeding program for Taiwan dairy cows. Summer milk production is critical to evaluate the performance of those of new imported Jersey. For 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 for exportation to Southeast Asia. In the summer of 2007, 680 milk samples taken from Jersey cow with comparison to statistics of 218,818 milk samples of Taiwan dairy cows (T) in 2006. Jersey cow had 27 kg of single day production yield (63 kg in T cow) with a mean of 15.5±4.0 kg (22.7 kg of mean in T cow). Milk fat, protein, lactose, and total solid were 4.69±0.97, 3.48±0.40, 4.83±0.30, and 13.71±1.04%, as comparison of T cow in which of 3.81% fat, 3.30% protein, 4.79% lactose and 12.59% total solid. J cows had a significantly higher fat percentage. Somatic cell counts averaged 722x10<sup>3</sup>/mL in J cow and significantly higher than the average of 322x10<sup>3</sup>/mL of T cow. Milk urea nitrogen, citric

acid, and P/F ratio in J milk were 14.4±5.8 mg/dL, 190.0±27.9 mg/dL, and 0.78. When milk yield was classified into 21 kg groups, frequency of them were 47(6.9%), 589(86.6%), and 44(6.5%). An average of 23.2±1.3 kg of milk yield in the high yield group with 4.48±0.89% fat, 3.38±0.20% protein, 4.79±0.21% lactose and 13.36±0.94% total solid. It indicated that high yield resulted in a less fat percentage. In conclusion, selection on both milk yield and quality trait in Jersey would be feasible.

Key Words: Dairy cattle, Selection, Milk quality

#### 雞隻賴菴性與性染色體上的泌乳素接受體基因之關聯性探討

#### 44. 雞隻賴菴性與性染色體上的泌乳素接受體基因之關聯性探討

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賴菴性是造成雞隻產蛋數低落的重要因素之一。本試驗利用畜試土雞近親品系9與來亨雞進行正反雜交產生雜交一代雞隻，雜交一代雞隻進行全同胞配種產生雜交二代雞隻，以建立參考族群。泌乳素接受體基因被定位於性染色體(Z)上。採集雞隻血樣進行泌乳素接受體基因(PRLR)基因型檢測，並結合母雞賴菴記錄進行關聯性分析。畜試土雞近親品系9 雞隻PRLR基因型頻率PP、PR及RR分別為42.4%、42.4%及15.2%，而來亨雞皆為PP基因型，顯示在畜試土雞近親品系9與來亨雞品系P間的PRLR基因型頻率存在顯著的關聯性 (P

關鍵語：雞、賴菴性、泌乳素接受體基因

#### ASSOCIATION STUDY OF CHICKEN BROODINESS AND PROLACTIN RECEPTOR GENE

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Chicken broodiness is considered as one of the major factors that decrease the potential of egg production. In order to set up a F2 design reference family for mapping of broodiness, the F1 hybrid progenies was produced by reciprocal crosses between LRI native chicken inbred line 9( LRI-L9) and Leghorn, and F2 progenies was produced by fullsib mating of F1. Prolactin receptor gene(PRLR) was on sex chromosome Z. Records of genotyping of DNA extracted from blood merged with broody records was used to explore the association between broodiness and genotype. PRLR of PCR-SSCP has three genotypes. The genotype frequency of PP, PR and RR in LRI-L9 were 42.4%, 42.4% and 15.2%, respectively. But, all leghorns were PP type in the collected samples. The G0 data showed an strong association between breed and genotype (P

Key Words: Chicken, Broodiness, Prolactin receptor gene

#### 試用可開機的含軟體工具組隨身碟進行種畜選育

#### 49. 試用可開機的含軟體工具組隨身碟進行種畜選育

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以兩種不同Linux套件，Ubuntu 7.04及Slackware12.0製作可開機的USB隨身碟，並安裝MATVEC, Octave, PEST, VCE及R語言等常用的育種軟體，嘗試使USB隨身碟成為便捷的隨身育種工具組。測試6種以上不同主機板電腦，結果發現製成的工具組套件若能完成開機，即可順暢運作，並讀出“宿主”硬碟中的育種資料(如文字型態檔案)，但現階段製成的USB隨身碟仍無法順暢於各種不同的電腦開啟。以USB隨身碟開機後，測試原來應用於現場的Microsoft Office 2000 Excel 種豬選拔指數運算表及乳牛評分表，則均可於Linux 版的Open Office-Calc下開啟並自動轉換原來編寫的函數，初步結果顯示USB隨身碟除了可提供便捷的育種資料貯存外，亦有可能發展成獨立的隨身育種工具組。

關鍵語：USB隨身碟、育種工具組、可開機

Pilot study of USB bootable flash disk with software kit use in the animal breeding practice

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From the idea of Self-Sufficient and Sustainable System (SSS) prototype to solve computer problems brought up by Supat Faarungsang, two Linux Distribution Releases, Ubuntu 7.04 and Slackware 12.0, installed into flash disks. The flash disks, with Octave, Matvec, PEST, VCE and R language installed, were tried to be an independent animal breeder's tool kit. Six different personal computers were tested. If USB flash disk is bootable in the tested personal computer, the Linux system can operate smoothly and breeders can manage his breeding data files(for example, Text data file) in the hosted machine. Testing two Microsoft Office 2000 Excel files, performance table for swine on farm test and cow type classification score, the Linux open office in USB stick can open the breeding data files and transform the existed mathematic functions of the files. From this pilot study, results showed USB bootable flash disk not only can use in mass animal breeding data storage but also can use as an independent tool kit for animal breeding and selection practice.

Key Words: USB flash disk, animal breeders' tool kit, bootable

超低溫凍存6種畜產植物 (1)添加DMA 對種子的影響

50. 超低溫凍存6種畜產植物 (1)添加DMA 對種子的影響

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畜產種原包括畜產動物、畜產植物及畜產微生物，為瞭解畜產植物-牧草種子對於超低溫保存的耐受性，對常用的2種禾本科(甜高粱、蘇丹草)與4種豆科(中東苜蓿、苕子、大豆、綠肥大豆台南7號)植物進行研究。各種子分5組(A,B,C,D,E)，每組百粒，分裝入冷凍小管(2ml)中，水份含量甜高粱11.9%、蘇

丹草12.7%、中東苜蓿9.7%、苕子12.4%、大豆9.1%、綠肥大豆台南7號10%，以4組(B,C,D,E)放入液態氮桶中，於液面上方3英吋 -186 氣態儲存10天，其中2組(B,C)加入12% dimethylacetamide(DMA)抗凍液，對照組(A)以常溫保存。解凍以40 溫水浸泡冷凍小管20分鐘(C,E)與26 常溫放置(B,D)方式進行，發芽觀查3天。結果顯示，5組6種牧草中，苕子皆未發芽，各組中以中東苜蓿抗凍能力為最佳，在各組發芽百分率依序為81、75、67、68、81，甜高粱為92、27、38、35、19，蘇丹草為79、4、2、16、12較差，大豆為83、0、0、18、26，顯示加入DMA後無法改善發芽率，綠肥大豆台南7號為86、12、27、24、70，亦顯示未加入DMA並以溫水解凍為宜。畜產種原之牧草種子以超低溫保存時，保存條件與解凍條件各異，在實施凍存時應先瞭解其適宜條件，才能復育發芽達成畜產種原保存的目的。

關鍵語：超低溫凍存、畜產植物、種子

#### Cryopreservation of Six Livestock Forages (I) Effect of DMA on Seeds

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Animal Genetic Resources include farm animals, livestock forages and livestock microorganisms. Information of Cryopreservation of Taiwan livestock forages is very limited. In this study, six species seeds, two in the grass family (Sweet Sorghum, Sudangrass) and four in the pulse family (Far east Alafa, Hairy vetch, Soybean, Green manure in soybean crops of Tainan No.7.) were stored in liquid nitrogen(LN) and water contents of the seeds of were 11.9%, 12.7%, 9.7%, 12.4%, 9.1% and 10%, respectively. Each specie has five treatments, group A(stored in room temperature thawed at 40 water), group B(12% dimethylacetamide, DMA, in -196 LN thawed at 26 room temperature), group C(12%DMA, in -196 LN thawed at 40 water ), group D(no DMA, in -196 LN thawed at 26 room temperature), and group E(no DMA, in -196 LN thawed at 40 water ). Each specie-treatment group had 100 seeds and was stored in 2ml frozen vials for 10 days and after then thawed for 20 minutes. Three days germination test for five treatments, from A to E, showed germination rates of (1) Sweet Sorghum were 92, 27, 38, 35 and 19% (2) Sudangrass were 79, 4, 2, 16 and 12% (3) Far east alfalfa with best germination rates were 81, 75, 67, 68 and 81% (4) were 0% for all treatments of Hairy vetch (5) Soybean were 83, 0, 0, 18 and 26%, and DMA had inferior effect on germination (6) Green manure in soybean crops of Tainan No.7 were 86, 12, 27, 24 and 70%, and the E group without DMA, thawed at 40 water was best. DMA did not improve germination rate in this study. Cryopreservation of seeds of Livestock Forages was feasible, but optimum conditions varied in different species.

Key words: Cryopreservation, Livestock forage, Seed

台灣乳牛單日乳&#63870;最高100名之月齡及其乳質

58.台灣乳牛單日乳&#63870;最高100名之月齡及其乳質

吳明哲(1)、賴永裕(1)、黃鈺嘉(1)、張菊犁(1)、&#63969;素珍(1)、曾青雲(1)、陳志毅(1)、施意敏(1)、王政騰(1)、陳榮泰(2)、丁進&#63789;(2)、王忠恕(3)



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台灣乳牛育種策上，期望以乳、乳質及繁殖性兼顧的選拔為主，培育台灣乳牛具有適應濕熱環境的特色，成為乳牛熱帶品系，並出口東南亞國家。因此，本研究自2001年1月至2007年9月間DHI資料庫www.angrin.tlri.gov.tw選取單日乳、最高100名乳樣記、進、產乳月齡及其乳質研討。至2007年9月底，單日乳、記、最高為68 kg，第100名為56 kg，最高100名乳牛檢測月齡平均為61.8+18.8月齡，產乳月齡範圍為32~121月齡。產乳月齡60月齡以內，有50%(50/100)。單日乳、最高100名之乳脂肪、蛋白質、乳、及體細胞、平均+標準偏差分別有3.37+0.91%、2.90+0.29%、4.72+0.24%及15.5+22.1萬細胞/mL。當與2006年台灣乳牛218,818乳樣之乳脂肪、蛋白質、乳、及體細胞、平均32.2萬細胞/mL比較，單日乳、最高100名之乳脂肪、蛋白質、明顯地較低，過單日乳、最高100名之乳質有關的體細胞、平均較2006年台灣乳牛體細胞、平均也較低，顯示高乳、僅、低脂肪、及蛋白質。當依、看單日乳、最高記、自2001至2007年依序為66、62、61、63、62、63及68 kg，該牛產乳月齡依序為41、90、77、70、54、46及60月齡，該牛、養地依序在高雄、雲、雲、屏東、雲、彰化及桃園。因此，應用DHI資訊把56 kg以上的高乳、牛的乳脂肪、蛋白質、乳、及體細胞、等乳質性、之乳、乳質兼顧的選拔方法，有、於牛群性能之改進。

關鍵語：乳牛、選育、乳質

TOP 100 RECORDS ON DAILY MILK YIELD OF TAIWAN DAIRY COWS AND THEIR MILKING 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 for exportation to Southeast Asia. Data were used to rank the top 100 records on daily milk yield and their age and milk quality from January of 2001 to September of 2007 based upon [www.angrin.tlri.gov.tw](http://www.angrin.tlri.gov.tw). The highest of 68 kg daily milk yield was recorded and the 100th record was 56 kg with a mean of milking age of 61.8+18.8 months old ranging between 32 and 121 months of age. There was 50% (50/100) of highest daily milk yield cows within 60 months of age. For those of Top 100 daily milk yield cows, milk fat, protein, lactose, and somatic cell counts were 3.37+0.91%, 2.90+0.29%, 4.72+0.24%, and 155+221x10<sup>3</sup>/mL, as comparison of 218,818 milking samples in 2006 in which of 3.81% fat, 3.30% protein, 4.79% lactose and 322x10<sup>3</sup>/mL. Top 100 cows had a significantly less fat%, protein%, and somatic cell counts. It indicated that high yield resulted in a less fat and protein percentage. Top record of each year from 2001 to 2007, there were 66, 62, 61, 63, 62, 63 and 68 kg, respectively, with the age of milking were 41, 90, 77, 70, 54, 46 and 60 months of age. Top record cows were

raised in county of Kaohsiung, Yunlin, Pingtung, Changhua and Taoyuan. In conclusion, selection on both milk yield and quality trait in those of above 56 kg on daily milk yield cows along with traits of milk fat, protein, lactose and somatic cell counts would be feasible.

Key Words: Dairy cattle, Selection, Milk quality

#### 種豬飼料效率遺傳標記選拔族群雜交一代之遺傳特性

#### 72. 種豬飼料效率遺傳標記選拔族群雜交一代之遺傳特性

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本試驗的目的是對1頭賓朗公豬(U)與7頭藍瑞斯女豬(L)交配所生之7胎56頭雜交一代(LU) 仔豬，應用生長性能測定與基因型篩檢方式，以瞭解其遺傳特質。雜交一代(LU) 仔豬公(N=11)與母(N=19)的150日齡日增重、飼料效率及背脂厚度，分別為0.52 kg與0.61 kg、2.55與3.11及1.78cm與2.23cm，其性能介於賓朗豬與藍瑞斯之間。將豬緊迫基因、多產基因及18個微衛星型遺傳標記所得到的遺傳標記交替基因分布頻率以套裝軟體BIOSYS分析，其結果顯示藍瑞斯女豬的平均異質性為0.49、賓朗公豬為0.30、雜交一代仔豬則為0.55，賓朗豬與藍瑞斯毛色皆為白色，而其雜交一代少部份仔豬有黑斑出現。

關鍵語：飼料效率、微衛星型標記、遺傳特性

gENETIC CHARACTERISTICS OF HYBRID population for mapping feed efficiency RELATED GENE(S) IN PIG

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The purpose of this study was to understand the genetic characteristics of seven litter hybrid pigs, bred from one Peinan boar and seven Landrace sows, by analysis of growth performance and genotype data. The average daily gain from birth to 150 days(ADG), feed efficiency (FE) and average backfat (BF) for hybrid boar and gilt were 0.52 kg and 0.61 kg, 2.55 and 3.10, and 1.78cm and 2.23cm, respectively. The growth performance of hybrid pig was between Peinan pig's and Landrace pig's. Allele frequencies of porcine stress gene, estrogen receptor (ESR) gene and 18 microsatellite markers were investigated and analyzed by the BIOSYS software package. The results showed that the mean heterozygosity of Landrace gilt, Peinan boar and hybrid pig were 0.49, 0.30, and 0.55, respectively. Peinan boar and Landrace sows are all white in color. In this study, some pigment spots were observed on the skin of F1 hybrids.

Key Words: Feed efficiency, Microsatellite marker, Genetic characteristics

## 建立台灣梅花鹿粒線體基因條碼

### 92. 建立台灣梅花鹿粒線體基因條碼

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粒線體用來建立動植物基因條碼是熱門研究，以序列歧異度建立基因條碼是新興分類方法，全世界仍有許多物種無法被分類，利用粒線體細胞色素C氧化 $\text{cytochrome c oxidase subunit 1}$  (C01) 區域，可做為一種快速、便宜、且可信的物種鑑別方法，此法雖然遭受分類學家質疑，但卻無法壓抑這股熱門研究風潮。本試驗設計5對引子，可增殖台灣梅花鹿 (*Cervus nippon taiouanus*) 粒線體tRNA-Tyr、C01、tRNA-Ser、tRNA-Thr、tRNA-Pro與D-loop基因，序列總長度2,818 bp，經由定序多個基因序列，可以增加基因條碼鑑識物種正確性與可信度，減少錯誤判斷率，並做為畜產種原與生產履歷發展之用。

關鍵語：粒線體、台灣梅花鹿、基因條碼

SET UP THE MITOCHONDRIAL DNA BARCODE IN TAIWAN FORMOSA DEER

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It is a hot research work which utilizing sequence diversity degree of mitochondrial DNA to set up the DNA barcode in the animals and plants. There are many species cannot be classified in the world yet, but examine of mitochondrial DNA cytochrome c oxidase subunit 1 (C01) area offers a kind of fast, cheap and creditable method to classify species differentiation. Although this way is queried by taxonomist, this hot research tendency has widely spread. Five pairs of primers having 2,818 bp were designed to amplified the fragments of tRNA-Tyr, C01, tRNA-Ser, tRNA-Thr, tRNA-Pro genes and D-loop region in Formosan sika deer mitochondrial DNA. By sequencing a lot of gene sequences, the DNA barcodes of mitochondrial DNA not only increase the accuracy and credibility as well as reduce the mistaken judgment among species distinction but also apply to the animal genetic resources and production traceability.

Key Words: Mitochondrial DNA, Formosan sika deer, DNA barcode