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乳質檢測乳牛群的血統登錄數及其年度增加率

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乳質檢測乳牛群的血統登錄數及其年度增加率

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種牛血統登錄、性能檢定及展示拍賣是種牛出口產業的三合一措施。牛群參加乳質檢測並應用 [www.angrin.tlri.gov.tw](http://www.angrin.tlri.gov.tw) 網路資訊化以來，具有父母親血統記錄的血統登錄泌乳牛頭數百分比(簡稱血統登錄率)從2001年的44.1% (12514/28381頭)、在2002年也增加測乳頭數6414頭及其血統登錄率增為49.7% (17239/34705)、2003年的54.9% (21618/39357)、2004年的60.6% (24365/40174)增至2005年60.8% (21404/35195, 僅1至9月)，這五年血統登錄率已增加16.7%，平均每年增加血統登錄率4.2%。測乳戶數上，該戶泌乳牛群至少有10頭血統登錄泌乳牛的戶數自2001年的214戶(287戶的74.5%)，增加至2002年的245戶(315戶的77.7%)、2003年的273戶(348戶的78.4%)、2004年的288戶(345戶的83.4%)、2005年的271戶(319戶的84.9%)，重視血統登錄牛的戶數增加10%。當以血統登錄泌乳牛頭數最多的100戶來看，第100名的血統登錄泌乳牛頭數在2001年是55頭(第一名是167頭)、在2002年是74頭(第一名是266頭)、在2003年是91頭(第一名是355頭)、在2004年是97頭(第一名是370頭)、在2005年是86頭(第一名是393頭)，每戶的血統登錄牛頭數規模自2001年的88.8+26.9頭、增加至2002年的109.3+34.6頭、2003年的124.2+37.3頭、2004年的136.0+43.0頭、2005年的124.7+40.1頭。頭數最多的血統登錄泌乳牛100戶之血統登錄率平均自2001年的71.6+17.4%，增加至2002年的79.4+16.8%、2003年的82.3+15.1%、2004年的85.8+13.0%、2005年的83.7+13.1%。依區域分析，2005年的血統登錄泌乳牛21404頭，在台南有24.2%、屏東有23.5%、彰化有13.6%、嘉義有13.2%、雲林有11.7%、高雄有7.1%、苗栗有2.1%、其他地區有4.6%，台南及屏東的血統登錄泌乳牛合計有47.7%之多。在2005年擁有200頭以上的血統登錄泌乳牛有台南順勝實業(393頭)、屏東李全弘(224頭)及屏東陳光雄(201頭)三戶。2001至2005年測乳資訊上網及種牛場登記的引導下，測乳戶對牛隻血統記錄重視度明顯地增加16.7%。

關鍵語：乳牛、血統登錄、測乳

PEDIGREE REGISTRATION OF MILKING COWS WITH MILK QUALITY AND ITS INCREASE RATE BY YEAR

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Pedigree registration, performance test and auction show are three main activities to develop the dairy industry of breeding stocks for international market. Cows with data of milk quality were webbed via [www.angrin.tlri.gov.tw](http://www.angrin.tlri.gov.tw) to improve herd production efficiency in Taiwan. Percentage of pedigree registration (PR rate) with parental data form 2001 to

2005 were 44.1%(12514/28381 head), 49.7% (17239/34705), 54.9%(21618/39357), 60.6%(24365/40174), up to 60.8%(21404/35195, only from Jan to Sept of 2005). PR rate grew 16.7% from the last five years with an annual increase of 4.2%. Comparison on the number of farm having at least 10 PR cows, 214 farms (74.5% of 287 farms), 245 farms (77.7% of 315 farms), 273 farms (78.4% of 348 farms), 288 farms (83.4% of 345 farms), and 271 farms (84.9% of 319 farms) were recorded in 2001 to 2005. A 10% of increase on number of farms having 10 or more PR cows was recorded. When the top 100 ranking farms ranked with the number of PR cows were selected, the number of PR cows in the 100th farm from 2001 to 2005 were 55 (167 head in the first one), 74 (266 head in 1st), 91 (355 head in 1st), 97 (370 head in 1st), and 86 cows (393 head in 1st). Mean with standard deviation of number of PR cows per farm were 88.8+26.9 head in 2001, 109.3+34.6 head in 2002, 124.2+37.3 head in 2003, 136.0+43.0 head in 2004, and 124.7+40.1 head in 2005. The PR rate of milking cows in those of top 100 farms was 71.6+17.4% in 2001, 79.4+16.8% in 2002, 82.3+15.1% in 2003, 85.8+13.0% in 2004, and 83.7+13.1% in 2005. Regional analysis for 21404 PR cows in 2005, there were 24.2% raised at Tainan, 23.5% at Pingtung, 13.6% at Chunghua, 13.2% at Chiayi, 11.7% at Yulin, 7.1% at Kaohsiung, 2.1% at Miaoli, and other regions having 4.6%. Both Tainan and Pingtung regions had 47.7% of PR cows to the whole. When the farm having 200 or more PR cows was selected, only three farms had the herd size and there were Tainan SS Farm (393 PR cows), Pingtung Lee Farm (224 PR cows) and Pingtung Chen Farm (201 PR cows). Overall, dairy farms under introduction of web information system and breeding farm establishment during the period of 2001 to 2005, the PR rate of milking cows had an increase of 16.7% from those of farms with a significant works on pedigree recording.

Key Words: Dairy cows, Pedigree registration, Test of milk quality

### 繁殖能力登錄乳牛的初產月齡、胎數及胎距

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經產母牛合於五歲三胎的繁殖能力登錄頭數增多是乳牛繁殖性能的評估要項，故計算母牛群之五歲三胎繁殖登錄合格牛百分比(RR%)有助於提昇母牛使用年限。網路DHI庫有來自458戶的血統登錄母牛56066頭，平均每戶完成122頭血統登錄紀錄筆數，其中有18506頭牛滿五歲。滿五歲母牛中有9086頭已產下三胎，RR%為49.1% (9086/18506)，RR母牛分散於360戶，顯示78.6% (360/458)的戶數有能力達到五歲三胎繁殖管理目標。RR牛50頭以上的地區有12區，RR牛頭數地區排名，台南有1949頭最多，彰化1696頭次多。各區的RR%，在台南有54.3% (1949/3589)、彰化有49.7% (1696/3326)、嘉義有58.2% (1506/2586)、屏東有40.5% (1277/3148)、雲林有46.3% (961/2072)、高雄有47.7% (559/1171)、苗栗有50.7% (462/910)、花蓮有36.5% (168/460)、台中有48.4% (145/299)、新竹有36.3% (139/382)、桃園有41.9% (133/317)、南投有50.4% (52/103)，RR%介於36.3~58.2%。繁殖性能分析上，選用台南、彰化、嘉義、屏東及雲林等五地區的最年輕100頭RR母牛，初產月齡分別為27.0+3.4、27.2+3.3、26.2+2.9、26.8+3.7、29.8+3.5；第三胎月齡為54.1+3.4、54.2+3.6、53.9+4.2、54.6+3.7、57.1+3.8；胎距為398+54、392+50、394+47、389+46、383+43。個別場分析上，RR母牛頭數最多的

一戶是雲林歐陽申助，RR%為62.6% (132/211)，其RR母牛之初產月齡為26.4+3.1、胎數為4.37+1.38、胎距為413+43及最高產次月齡為72.6+19.8。第一家政府核發的彰化王百練種牛場RR%為42.2% (62/147)，RR母牛之初產月齡為27.3+3.6、胎數為5.03+1.88、胎距為416+37、以及最高產次月齡為83.6+27.1。再者，自1996至2005年的DHI牛群之乾乳年齡平均為5.29、5.29、5.33、5.25、5.22、5.17、5.09、5.05、5.02、5.12歲，逐年減低。因此，當設定乾乳年齡平均七歲為繁殖管理目標以提昇母牛使用年限時，能再以初產月齡26月、五歲三胎、前三胎胎距383天及七歲五胎等繁殖指標來選留高等繁殖登錄母牛，促使乳牛初產月齡減低及胎距縮短。

關鍵語：乳牛、繁殖登錄、胎距

AGE AT FIRST CALVING, NUMBER OF CALVING AND CALVING  
INTERVAL IN COWS WITH REPRODUCTION REGISTRATION

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Cow having three calving within five years old (RR cow) is essential to reproductive performance of cows in a dairy herd. Percentage of RR cows (RR%) is useful for lifespan improvement of cows. Data of 56066 cows from 458 farms with 122 cows per farm were used and 18506 cows had five years old. RR cows were raised at 360 farms and 78.6%(360/458) of farms having RR cows. Among various areas, the RR% was 49.1% (9086/18506) in total with a range of 36.3-58.2%. Tainan had 1949 head in 1st rank among 12 areas and Chungku in 2nd rank with 1696 head. The RR% was 54.3% (1949/3589) in Tainan, 49.7% (1696/3326) in Chungku, 58.2% (1506/2586) in Chiayi, 40.5% (1277/3148) in Pingtung, 46.3% (961/2072) in Yulin, 47.7% (559/1171) in Kaohsiung, 50.7% (462/910) in Miaoli, 36.5% (168/460) in Hualien, 48.4% (145/299) in Taichung, 36.3% (139/382) in Hsinchu, 41.9% (133/317) in Taoyuan, and 50.4% (52/103) in Nantou. Analysis of reproductive performance with the 100 youngest RR cows in Tainan, Chungku, Chiayi, Pingtung and Yulin were conducted. Ages at first calving were 27.0+3.4, 27.2+3.3, 26.2+2.9, 26.8+3.7, and 29.8+3.5 month, respectively. Ages at third calving were 54.1+3.4, 54.2+3.6, 53.9+4.2, 54.6+3.7, and 57.1+3.8 month old with calving interval of 398+54, 392+50, 394+47, 389+46, and 383+43 day. Among of 360 farms, Yulin Oaouyoung Farm had the largest number of RR cows with 62.6%(132/211) of RR%. RR cows at Oaouyoung Farm had 26.4+3.1 months old at first calving, 4.37+1.38 times of calving, 413+43 days of calving interval, and 72.6+19.8 months old at the highest parity. Wang Breeding Farm, the first certified breeding farm from government, had 42.2% (62/147) of RR% and RR cows had 27.3+3.6 months old at first calving, 5.03+1.88 times of calving, 416+37 days of calving interval, and 83.6+27.1 months old at the highest parity. Ages at drying were 5.29, 5.29, 5.33, 5.25, 5.22, 5.17, 5.09, 5.05, 5.02, 5.12 years old from 1996 to 2005, respectively, with a decrease tendency in age. First calving at 26 month old, three calving within five years old, 383 days of calving interval, and five calving within seven years old could be used for decreasing the age at first calving and shortening calving interval for reproductive registered cows at lifespan of seven years old.

Key Words: Dairy cows, Reproduction registration, Calving interval

## 結合程式語言讀寫格式編輯DNA條碼

### 結合程式語言讀寫格式編輯DNA條碼

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程式語言讀寫格式具有讀取/儲存短整數、長整數、字串、二進位、八進位、十六進位等資料格式功能，與DNA訊息結合編輯後，可作為DNA條碼的一部份。此類DNA條碼，不適合採用EAN-8或EAN-13等零售商使用的短位數一維條碼，因為短條碼本身無法提供足量的商品資訊，除非與後端的資料庫結合。當長位數的條碼作為DNA條碼使用時，DNA條碼本身即可作為產品的特性證明，如 EAN-128或二維條碼，使用者可以在掃讀後直接了解條碼儲藏的DNA資訊。本試驗以EAN-128 編輯雞與牛的單點核酸變異(SNP)遺傳標記條碼，同時嘗試將不同豬品種的粒腺體 D-loop 區段以PDF417二維條碼編輯列印。利用識別碼加上程式語言讀取/儲存格式、識別碼加上遺傳標記名稱與遺傳型，或識別碼加上DNA序列資料等組合式條碼編輯方法進行編碼。由於豬的粒腺體D-loop 區段超過1000個以上的核酸，除以十六進位編輯方法外，亦可將整段序列的冗長共同區，以跳格的方式略去編輯，使條碼更為簡潔。DNA條碼的功能除了其他學者提過的保密與防偽功能(基因身份證)外，本試驗嘗試提供DNA條碼的另一種用途。

關鍵語：DNA條碼、單點核酸變異、核酸序列

DNA BARCODE EDITING WITH FORMAT STRING OF COMPUTER LANGUAGES

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Format string of computer languages can deal with short integer, long integer, character strings, octal Constants and hexadecimal constants. Editing DNA barcode with the format string can provide understandable message of product without connection of database. Although the major retail barcode types are "short" barcodes (for example, EAN-8, EAN-13), the connected database can provide enough information for business management. Using larger barcode zones for DNA barcodes can approach certification for bio-products by its own stored information. Sets of single nucleotide polymorphism of chicken and cattle, and nucleotide sequences of D-loop region in mitochondrial DNA of *Sus scrofa domestica* were edited to EAN-128 or PDF417 2D barcode with the format strings of computer language in this study. Application Identifiers (AI) and the format string data, AI and the SNP data, or AI and the nucleotide sequence data were tested. Because the D-loop region has more than 1000 nucleotide acid, hexadecimal constants or skip space format were used to simplify the storage of nucleotide sequence information. In addition of preventing imitation and protection secreta data (DNA ID), DNA barcode with the format string can provide information for traceability and quality control.

Key Words: DNA barcode, Single nucleotide polymorphism, Nucleotide sequence

## DHI乳牛群之脊椎畸形複合症(CVM)基因型頻率

## DHI乳牛群之脊椎畸形複合症(CVM)基因型頻率

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脊椎畸形複合症 (Complex Vertebral Malformation, CVM) 是一種已發現於荷蘭乳牛的致死隱性遺傳缺陷，導致母牛早產或是死產而造成酪農經濟損失。台灣的荷蘭乳牛為生產用單一乳用品種，並廣泛使用進口冷凍精液。本研究利用聚合 $\times$ 連鎖反應 (PCR) 與單股構形多態性 (Single Strand Conformation Polymorphism, SSCP) 方法來檢測此一遺傳疾病，由DHI乳樣進行篩檢，並估計台灣荷蘭牛泌乳牛群脊椎畸形複合症之頻率。檢測來自132 個DHI乳牛場共856 頭泌乳牛乳樣。在856頭荷蘭種泌乳牛中有98頭為雜合型個體牛(CV)，758頭為正常型牛(TV)，所有檢測樣本中未存在有病型(CVM)個體，雜合型牛之頻率達11.4 %。通常隱性純合子型的胚胎會胎死腹中，故正如預期地並未檢測出隱性純合子型的有病型(CVM)個體。依本研究的數據可估計現階段台灣牛群中，脊椎畸形複合症的雜合型個體(CV)的頻率約在10%以上。

關鍵語：脊椎畸形複合症、聚合 $\times$ 連鎖反應、單股構形多態性

## GENOTYPE FREQUENCY OF COMPLEX VERTEBRAL MALFORMATION OF DHI HOLSTEIN COWS

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Complex Vertebral Malformation, CVM, is a lethal genetic defect in Holstein dairy cattle and refers to a combination of symptoms that include fused or misshapen vertebrae, contracted joints in the front and rear legs, and reduced body size. In Taiwan, Holstein breed is the only breed for dairy production and cows of DHI herds are now inseminated by using imported frozen semen. A total of 856 milk samples from 132 DHI farms were collected and extracted DNA for the test. CVM genotypes were tested by PCR-SSCP method. Ninety-eight samples were detected as CVM carriers (11.4%, 98/856). Due to the fact that most individuals having homozygous recessive genotype would die in embryonic or fetal stage, no homozygous recessive animal was detected in this investigation. The estimated percentage of CVM carrier Holstein cows in Taiwan is about 10 %.

Key Words: Complex vertebral malformation, PCR, SSCP

## 乳牛群乳量及乳質的年度改進速率

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乳牛群參加乳量乳質檢測有助於提昇牧場經營效率。應用[www.angrin.tlri.gov.tw](http://www.angrin.tlri.gov.tw)網路資訊化以來，自2001至2005年間平均每戶每月有65、70、73、74、70頭泌乳牛參加乳測。每頭每日產乳量從2001年的21.46kg(176819頭次/287戶)、增為2002年的21.77kg(220193頭次/315戶)、2003年的22.02kg(243053頭次/348戶)、2004年的22.17kg(248822頭次/345戶)、2005年的22.73kg(169359頭次/319戶，僅1至9月)，這五年來，每頭日產乳量平均已增加3.31%，年度改進速率有0.83%。具有22kg以上的高乳量戶數上，該戶總乳中每毫升體細胞數少於30萬個的戶數自2001年的35戶(116高乳量戶的30.1%)，增加至2002年的41戶(136戶的30.1%)、2003年的63戶(161戶的39.1%)、2004年的79戶(164戶的48.1%)、2005年的77戶(178戶的43.2%)，乳量及乳質並重的戶數增加2.2倍(77戶/35戶)。當以上述乳量及乳質並重的戶來看，日產乳量在2001至2005年分別有24.15+1.68、24.58+1.75、24.41+1.73、24.41+1.81、24.87+2.24kg；體細胞數分別為21.05+4.09、21.92+3.88、21.02+4.00、20.54+3.80、19.67+5.40萬個/mL；固形物含量有12.28+0.36、12.38+0.26、12.39+0.26、12.45+0.29、12.47+0.28%；乳蛋白質與脂肪比(P/F ratio)有0.89+0.07、0.88+0.06、0.87+0.05、0.87+0.06、0.89+0.05。乳質的體細胞數減少量及固形物含量增加率在五年來，年度改進速率分別有1.63%及0.38%。再依每戶年度最高的日產乳量分析，2001至2005年最高日乳量平均分別有46.57+5.25、47.26+5.37、47.63+5.00、46.92+4.85、47.36+5.68kg，暗示乳量及乳質並重的牛隻泌乳高峰在47kg。在2005年的乳量及乳質並重的77戶優質戶，其乳脂肪含量平均為3.73+0.23%、蛋白質含量平均為3.24+0.07%及乳糖含量平均為4.80+0.05%。在2005年優質戶中的許慶良牧場有最高日產乳量有31.79kg、體細胞數為16.89萬個/mL、固形物含量有12.60%。根據上述測乳資訊，牛群的乳量及乳質可逐年同步改進。

關鍵語：乳牛、乳量、乳質

ANNUAL INCREASE OF MILK YIELD AND QUALITY OF COWS

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Production efficiency of dairy farm is achieved by participating test of milk quality. Application of web information of [www.angrin.tlri.gov.tw](http://www.angrin.tlri.gov.tw) for analysis of milk yield and quality, an average of number of cows per farm was 65, 70, 73, 74, and 70 head from 2001 to 2005, respectively. Daily milk yield per cow from 2001 to 2005 were 21.46 (176819 milk samples collected from 287 farms), 21.77 (220193, 315), 22.02 (243053, 348), 22.17 (248822, 345), 22.73 kg (169359, 319, only from Jan to Sept of 2005). For the last five years, an increase of 3.31% on daily milk yield was obtained with the annual increase rate of 0.83%. Elite farms having mean daily milk yield greater than 22 kg and with less than 30 x10<sup>4</sup>/mL of milk were selected, there were 35 farms (30.1% of 116 high production farms having greater than 22 kg of daily milk yield) in 2001, and there were 41 farms (30.1% of 136 farms), 63 farms (39.1% of 161 farms), 79 farms (48.1% of 164 farms), and 77 farms (43.2% of 178 farms) from 2002 to 2005. Number of elite farms increased 2.2 times (77 farms/35 farms) from 2001 to 2005. Milk yield and quality from those of elite

farms were averaged by milking year, daily milk yield were 24.15±1.68, 24.58±1.75, 24.41±1.73, 24.41±1.81, 24.87±2.24kg from 2001 to 2005, respectively; somatic cell counts were 21.05±4.09, 21.92±3.88, 21.02±4.00, 20.54±3.80, 19.67±5.40 x10<sup>4</sup>/mL; total solid content were 12.28±0.36, 12.38±0.26, 12.39±0.26, 12.45±0.29, 12.47±0.28%; protein to fat ratio (P/F ratio) were 0.89±0.07, 0.88±0.06, 0.87±0.05, 0.87±0.06, 0.89±0.05. Annual decrease amount on somatic cell counts was 1.63% and annual increase percentage of total solid content was 0.38% for the last five years. Analysis on data of the highest daily milk yield of the year for each farm, year mean of the highest daily milk yield were 46.57±5.25, 47.26±5.37, 47.63±5.00, 46.92±4.85, 47.36±5.68kg from 2001 to 2005, respectively. It indicated that the yield peak of lactation curve was 47 kg from those cows in the elite farms. Among those of 77 elite farms in 2005, milk fat content averaged 3.73±0.23% and with 3.24±0.07% of milk protein content and 4.80±0.05% of milk lactose. In 2005, the greatest amount of daily milk yield was 31.79 kg from Hsu Farm with 16.89 x10<sup>4</sup> cells/mL and 12.60% of total solid content in milk quality. According the above results, both milk yield and quality for milking cows were improved annually.

Key Words: Dairy cows, Milk yield, Milk quality

#### 畜試近親土雞產蛋性能之研究

#### 畜試近親土雞產蛋性能之研究

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本研究目的旨在探討畜試所育成之近親土雞之產蛋性能。雞隻於16週齡後個別籠飼、並進行繁殖性能檢定包括初產日齡、初產體重、初產至 40 週齡產蛋數、40 週齡體重及蛋重。研究結果顯示：1986-2002年畜試土雞L7、L9、L11及L12等四個品系之近親係數分別為 $0.83 \pm 0.51$ 、 $0.75 \pm 0.05$ 、 $0.79 \pm 0.26$ 及 $0.81 \pm 0.69$ 。初產日齡、初產體重、40週齡體重、40週齡存活雞隻產蛋數及40週齡時之蛋重等均呈顯著差異( P

關鍵語：土雞、產蛋性能、近親品系

#### A STUDY ON THE LAYING PERFORMANCE OF LRI INBRED LINES OF NATIVE CHICKEN

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Comparison of the laying performance for four inbred lines of native chicken at Livestock Research Institute, Council of Agriculture from 1986 to 2002 and they were called as LRI

L7, L9, L11 and L12 inbred native chickens. The period of cage rearing was between 16 and 40 weeks of age. The testing items included were age at first egg, body weight at first egg, the average egg number up to age of 40 weeks, body weight at 40 weeks and egg weight at 40 weeks. The inbreeding coefficients of L7, L9, L11 and L12 were  $0.83 \pm 0.51$ ,  $0.75 \pm 0.05$ ,  $0.79 \pm 0.26$ , and  $0.81 \pm 0.69$ , respectively. The age at first egg did not differ significantly between L7 and L9, but L11 and L12 achieved puberty at an older age (P  
Key Words: Native chicken, Laying performance, Inbred line

## 雞種的熱休克蛋白70基因頻率

## 雞種的熱休克蛋白70基因頻率

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熱休克蛋白(Heat shock protein, HSP)是指細胞在反應刺激原的誘導下所生成的一組蛋白質，特別是環境高溫的誘導。熱休克蛋白70 (HSP70) 是熱休克蛋白家族的一重要成員，在動物細胞生長、發育、繁殖、基因表現及蛋白質合成扮演重要的角色。雞隻受熱緊迫時HSP70在許多組織有高的活性表現，此現象可能與已知熱休克蛋白70的多態性有關。從84隻來亨雞、48隻白肉雞、104隻紅羽土雞、以及590隻畜試土雞近親品系L7、L9、L11與L12：分別有99、174、155及162隻血樣，萃取DNA，並應用聚合 $\&\#37238$ ;連鎖反應與單股構形多態性(Single Strand Conformation Polymorphism, SSCP)方法來檢測HSP70基因型。總共826個樣品，檢出3種基因型 (AA、AB及BB)。因此，HSP70的交替基因有A 與 B兩個。HSP70的交替基因A 頻率在來亨蛋雞、白肉雞、紅羽土雞、畜試土雞近親品系L7、L9、L11及L12分別為0.03、0.09、0.37、0.93、0.59、0.62及0.63。本土雞種畜試土雞近親品系及紅羽土雞的交替基因HSP70A 頻率顯著地高於外來雞種來亨蛋雞及白肉雞基因頻率(P  
關鍵語：雞、熱休克蛋白70、單股構形多態性

## ALLELE FREQUENCY OF HEAT SHOCK PROTEIN 70 GENE IN CHICKENS

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Heat shock protein 70 (HSP70) is an important member of heat shock protein family and play an important role in animal cell growth, development, and prolificacy, gene expression and protein synthesis, folding and transportation. HSP70 is induced by heat stress and highly expresses in many tissues under heat stress. Genomic DNA samples were extracted from blood samples of 84 white Leghorn layers, 48 white commercial broilers, 104 red feather native chickens, and a total of 590 birds from four inbred lines of TLRI native chicken. Blood samples of TLRI inbred lines were 99 of L7, 174 of L9, 155 of L11 and 162 of L12. All of 826 samples were used in the PCR-SSCP method to detect HSP70 genotype. Three genotypes of AA, AB and BB were classified. The gene frequency of allele A of HSP70 locus were 0.03 in white Leghorn layer, 0.09 in white commercial broiler, 0.37



in red feather native chicken, 0.93 in L7, 0.59 in L9, 0.62 in L11, and 0.63 in L12, respectively. Results indicated that native breeds of TLRI inbred lines and red feather native chicken had a significant higher frequency of HSP70A allele than exotic breeds of Leghorn layer and white broiler had (P

Key Words: Chicken, Heat shock protein 70, SSCP

從雞糞堆肥篩選產生胞外蛋白之微生物

從雞糞堆肥篩選產生胞外蛋白之微生物

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本研究總共使用約3.5立方公尺之糞於發酵槽中製作堆肥，並持續記錄堆肥分別為30、50及70公分深之溫度變化。於堆肥50公分處深測得發酵最高溫度約66℃，並進行採樣。將樣品分別保存於4℃冷藏櫃與凍存於-70℃冷凍櫃中。將冷藏之堆肥樣品溶於滅菌水後，再分別塗抹於胰蛋白大豆洋菜培養基與含5%脫脂奶粉之蛋白大豆洋菜培養基上，在50℃培養下胰蛋白大豆洋菜培養基上能長出眾多不同之菌落，並可在含5%脫脂奶粉之蛋白大豆洋菜培養基挑選到產生胞外蛋白之菌株共八株。由16S rDNA序列分析得知，此八株菌除一株為產鹼桿菌屬外，其他皆為桿菌屬。當這些分離株與商業化或專利菌株比較其蛋白活性時，有些分離株的活性比較高。因此，有些分離株具有進一步研究的潛力。

關鍵語：雞糞堆肥、胞外蛋白、發酵槽

SCREENING FOR EXTRACELLULAR PROTEASE PRODUCING  
MICROORGANISMS FROM CHICKEN MANURE COMPOST

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A total of 3.5 cubic meter of chicken manure was used for composting in fermentor in this study. The temperature profiles of depth of 30, 50 and 70 cm, respectively, under the compost were continuously recorded. During the composting, the highest temperature under

the 50 cm depth of compost was 66 and then the compost was sampled in the region. The samples were preserved in 4 refrigerator and -70 freezer, respectively. The sample in the refrigerator was weighed 0.5 gram to be dissolved in 20 ml of autoclaved water and 100  $\mu$ l of the suspension was spread on TSA and TSA-5 % skim milk plates, respectively. There were many different colonies formed on TSA plate at 50 of incubation. Eight isolates capable of secreting extracellular proteases were obtained from TSA-5 % skim milk plates. Identifying the eight isolates by 16S rDNA sequencing, only one isolate belonged to Alcaligenes genus, and the others Bacillus genus. While comparing the protease activity, some of the isolates were superior to the commercialized and patented strains. Therefore, there was potential for studying the isolates in the future.

Key Words: Chicken manure compost, Extracellular protease, Fermentor

### 桃園豬皮膚組織彈性纖維切片觀察

#### 桃園豬皮膚組織彈性纖維切片觀察

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為增進畜產種原生物多樣性寶貴資源與永續利用目標，近年陸續建立桃園豬皺紋數位相片檔案與皺紋量測方法。本年度選定桃園豬與藍瑞斯各一胎豬隻進行皮膚組織彈性纖維切片觀察，手術時間為出生一日齡與一月齡仔豬，採樣區域為桃園豬皺紋發生處明顯且皺摺多部位，分別為額頭、身體側邊與尾巴。將豬隻以硫酸阿托品 (Atropine sulfate) 與舒泰50 (Zoletil 50) 進行全身麻醉，將取樣後組織放入福馬林保存，樣品經由Verhoeff氏彈性纖維染色法進行組織包埋固定、切片與染色，將完成後玻片經由電子顯微鏡觀察，彈性纖維(elastic fibers) 及細胞核呈現黑色，膠原纖維 (collagen) 呈現紅色，其他部分的組織則呈現黃色。本實驗結果桃園豬與藍瑞斯於出生一日與一月齡組織切片在額頭、身體側邊與尾巴分別呈現不同程度點狀彈性纖維，血管內壁亦可見彈性纖維存在，但一日齡與一月齡桃園豬與藍瑞斯並未發現細帶狀黑色彈性纖維。

關鍵語：桃園豬、皮膚、彈性纖維

#### ELASTIC FIBERS SECTION ON SKIN TISSUE OF TAOYUAN PIG

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To preserve and utilize the biodiversity of animal genetic resource, the wrinkles of Taoyaun pig have built the digital files and measuring method in recent years. A litter

of Taoyaun piglet was randomly selected to observe the skin tissue section in this annual project, and Landrace piglets were the control. The ages of the piglets on birth and one month were sampled from the forehead, body side and tail which had initial and significant wrinkles. The piglets were injected Atopine sulfate and Zoletil 50 to take general anesthesia, and sampled the skin tissue to reserve in formalin. By the Verhoeff's elastic fiber dye method, the dyed sections were inspected with the electronic microscope. The elastic fiber and nucleus were displayed in black, collagen was showed in red and the other tissues were exhibited in yellow. The results indicated that Taoyaun and Landrace's skin tissue sections on the ages of birth and one month piglet showed dotted elastic fibers on the forehead, body side, tail and intima, but striped elastic fibers were not discovered on Taoyaun and Landrace's section samples.

Key Words : Taoyaun pig, Skin, Elastic fibers

### 不同品種女豬的飼料效率探討

#### 不同品種女豬的飼料效率探討

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台灣豬隻飼料原料大多仰賴進口，因此長年來豬隻飼料效率被列為種豬群生長性能選拔的重要性狀之一。應用育種場自94年4月至9月完檢的67頭藍瑞斯、2頭約克夏及2頭杜洛克為基礎，對照比對中央檢定站南站200408至200504期完檢的47頭藍瑞斯、8頭約克夏及27頭杜洛克個檢女豬。檢定站種豬來源包括水波、願景金來、高昌、福昌、義昌、合興、順安、金山等種豬場的豬隻。研究採逢機區集方式，進行飼料效率效應分析。中央檢定站南站不同女豬品種100公斤平均修正日齡為藍瑞斯145.47日、約克夏148.88日及杜洛克152.30日之情況下，其飼料效率平均為藍瑞斯2.19、約克夏2.19及杜洛克2.09，育種場不同女豬品種從70日齡開檢(藍瑞斯平均體重24.48kg、約克夏平均體重28.15kg及杜洛克平均體重30.75kg)至150日齡(藍瑞斯平均體重92.48kg、約克夏平均體重95.00kg及杜洛克平均體重100.50kg)完檢，其飼料效率為其飼料效率平均為藍瑞斯2.50、約克夏2.57及杜洛克2.63。初步結果顯示女豬飼料效率場間差異顯著 (p

關鍵語：飼料效率、藍瑞斯女豬、台灣

#### FEED EFFICIENCY OF PURE BREED GILTS

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In Taiwan, most of the feed ingredients for pig production are imported. Therefore, feed

efficiency is one of the most important traits for swine breeding goal 's. To investigate feed efficiency of different breed gilts, performance test data of 67 Landrace(L), 2 Yorkshire(Y) and 2 Duroc(D) gilts, finished on farm test in a research farm from Apr. 2004 to Sep. 2005, was selected first. Data of class 200408 to 200504 of the Southern Central test station was sampled simultaneously, which has 47 L, 8 Y and 27 D gilts. The gilts in test station were from eight different breeding farms. Adjusted age at 100kg body weight of test station gilts were 145.47(L), 148.88(Y) and 152.30(D) days and the feed efficiency were 2.19(L), 2.19(Y) and 2.09(D), separately. . The research farm gilts with 70 and 150 days of age to start and finish the performance test, the average feed efficiency were 2.50(L), 2.57(Y) and 2.63(D), separately. The results showed farm effect was differ significantly, but no differences among breeds were detected. The feed efficiency of Duroc gilts of research farm was slightly worse than Landrace and Duroc gilts ' , which might related to its smaller population size constrained selection intensity and selection difference.

Key Words: Feed efficiency, Landrace gilt, Taiwan