

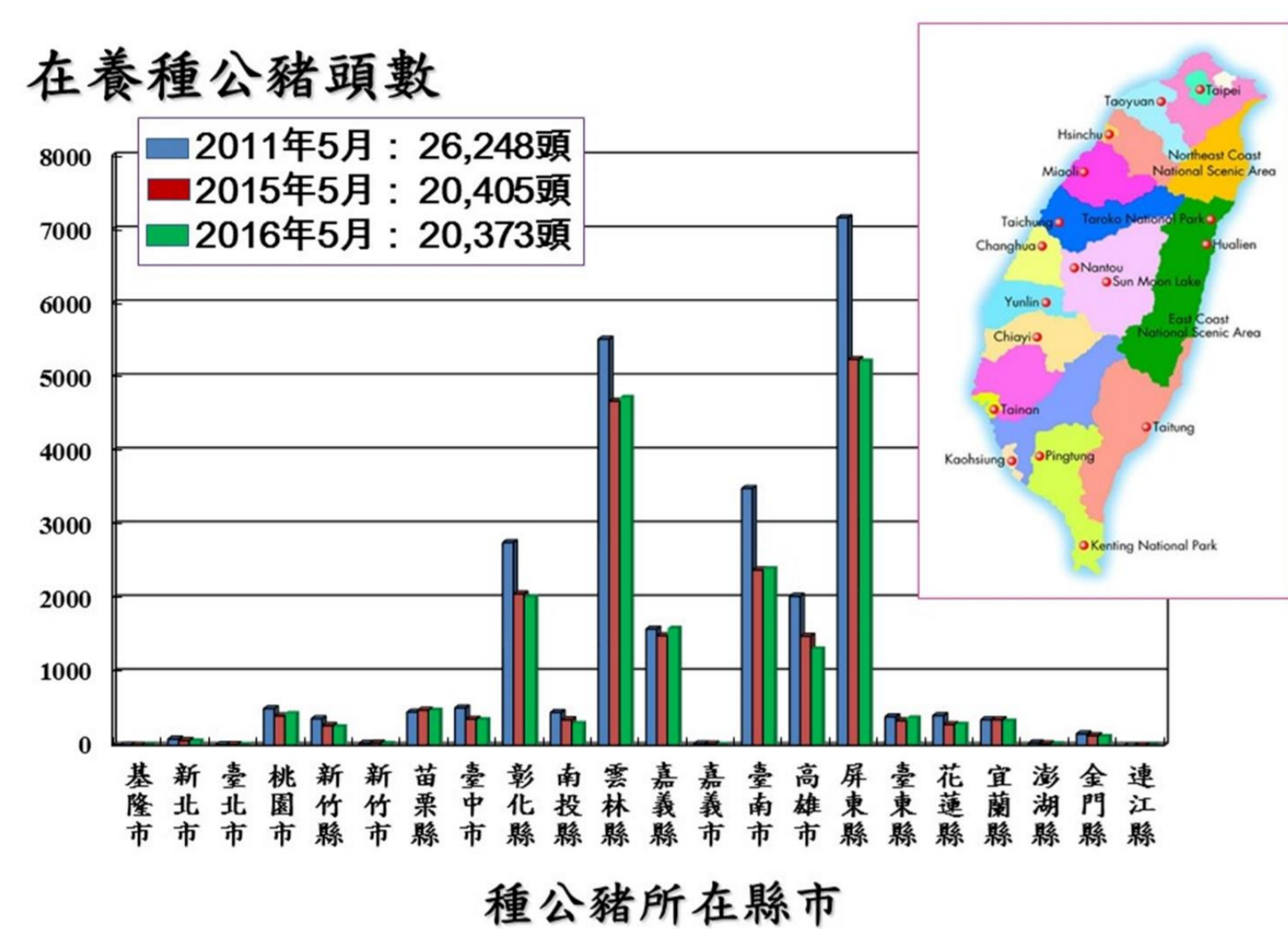
# 生長性能檢定合格種豬之體型評級與XY染色體之骨架基因關係研究

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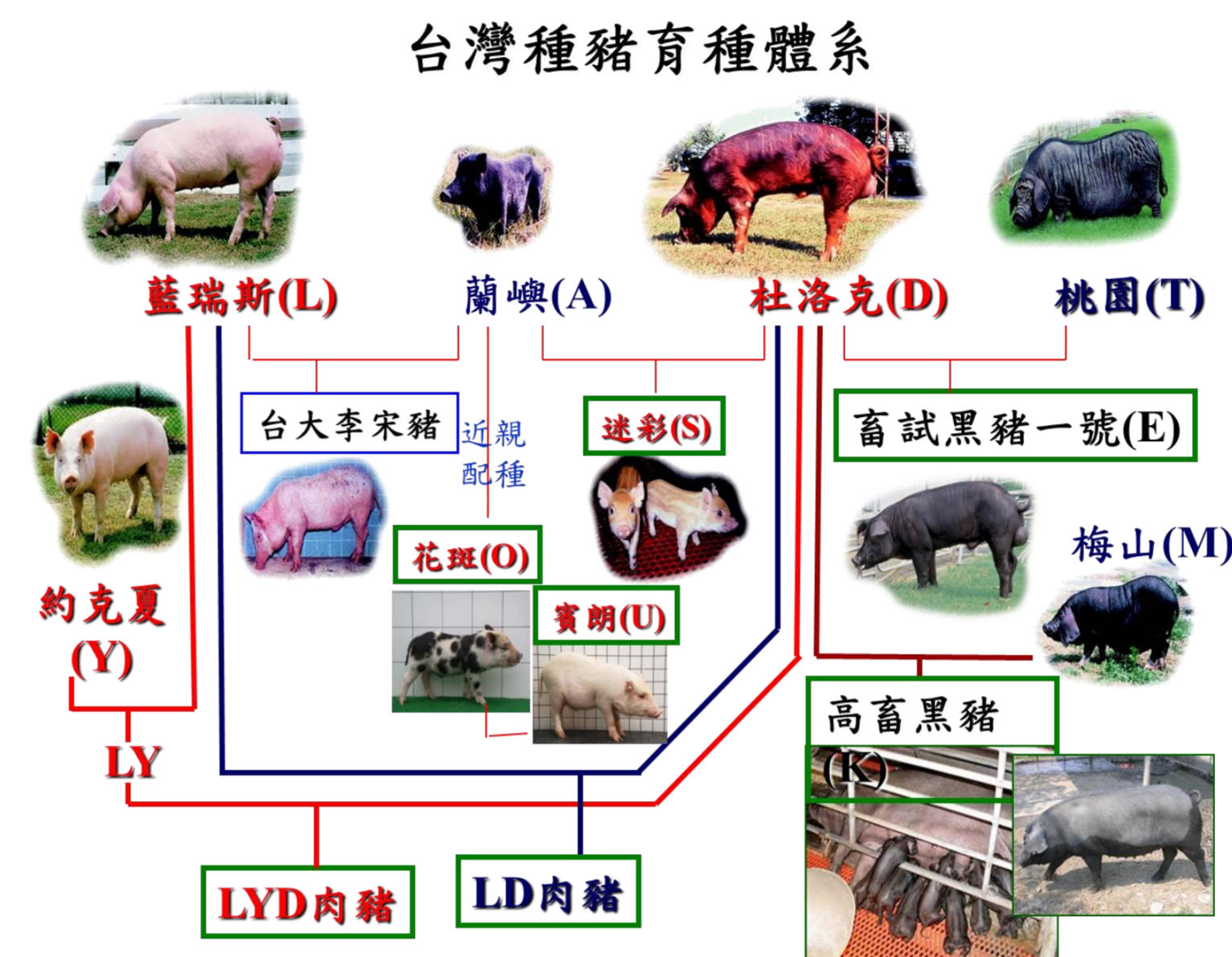
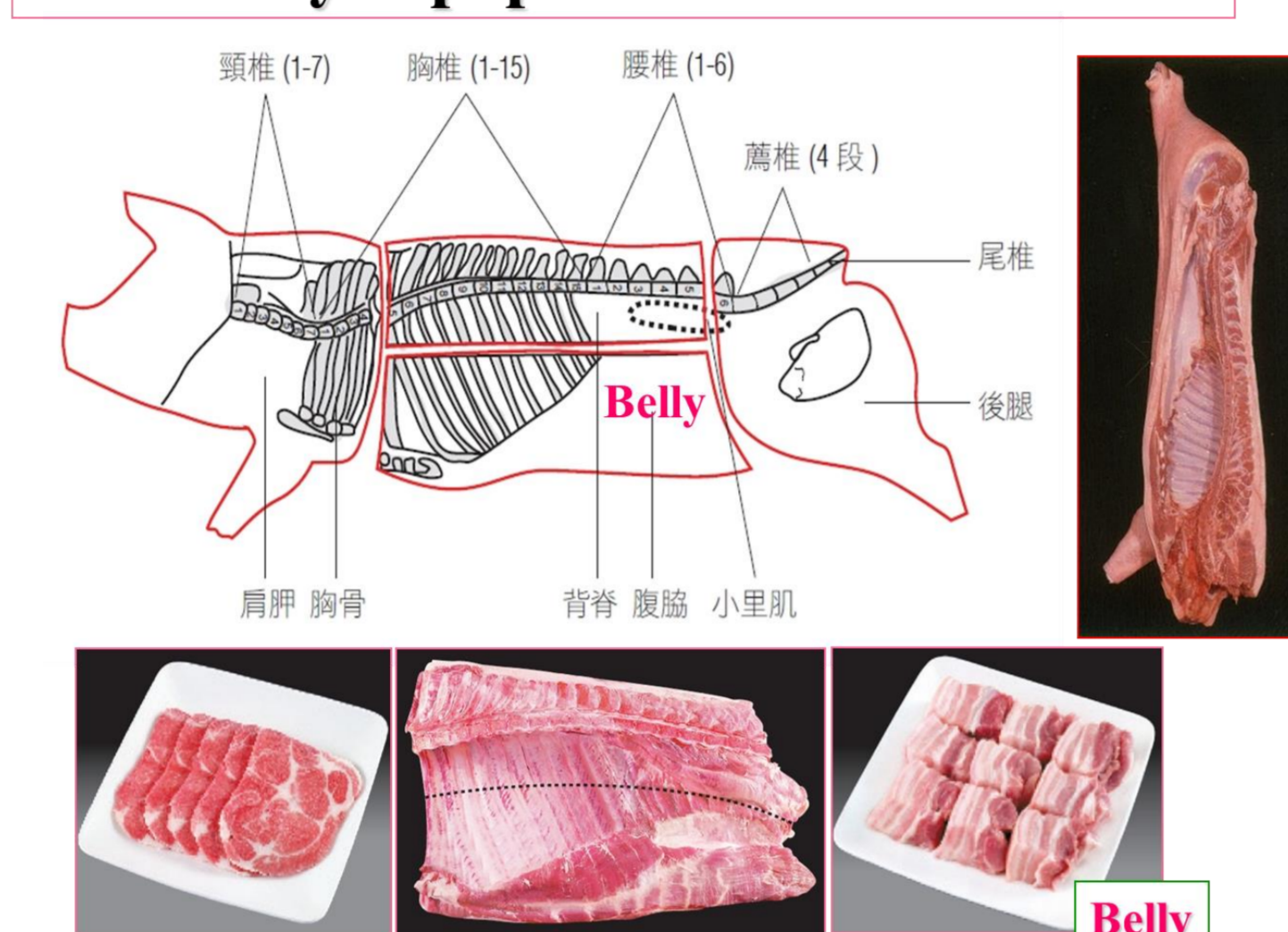
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## 背景說明

體型與瘦肉量息息相關，種豬場對體型的重視可從歷來展示拍賣會豬成交價與生長指數排名間之不一致，看出標購種豬的養豬戶還是對體型很重視。國內種豬育種制度已能藉由生長性能檢定來選拔生長好且高飼效種豬，並能將體型評比納入檢定合格豬拍賣目錄，落實七月齡種豬體型改良工作。畜產試驗所對中央畜產會每期檢定豬亦分析其在X染色體73cM位置之微衛星標記SY11(骨架基因)基因型，骨架基因之交替基因間鹼基數長短(bp)依序有161~177bp等9個交替基因。



## Pork belly is popular in Asian cuisine!



## 台灣種豬性能改進之檢測性狀採用年曆

Year	Color	Sex	Weight	Length	Depth	Width	Height	Legs	Feet	Tail	Genotype
1971	藍色	公	110kg	110cm	15cm	15cm	100cm	3	3	3	175+0
1975	藍色	母	100kg	100cm	15cm	15cm	100cm	3	3	3	171+0
1980	藍色	公	110kg	110cm	15cm	15cm	100cm	3	3	3	175+0
1986	藍色	母	100kg	100cm	15cm	15cm	100cm	3	3	3	171+0
1990	藍色	公	110kg	110cm	15cm	15cm	100cm	3	3	3	175+0
1996	藍色	母	100kg	100cm	15cm	15cm	100cm	3	3	3	171+0
2000	藍色	公	110kg	110cm	15cm	15cm	100cm	3	3	3	175+0
2002	藍色	母	100kg	100cm	15cm	15cm	100cm	3	3	3	171+0
2005	藍色	公	110kg	110cm	15cm	15cm	100cm	3	3	3	175+0
2007	藍色	母	100kg	100cm	15cm	15cm	100cm	3	3	3	171+0
2011	藍色	公	110kg	110cm	15cm	15cm	100cm	3	3	3	175+0
2013	藍色	母	100kg	100cm	15cm	15cm	100cm	3	3	3	171+0
2014	藍色	公	110kg	110cm	15cm	15cm	100cm	3	3	3	175+0
2015	藍色	母	100kg	100cm	15cm	15cm	100cm	3	3	3	171+0
2016	藍色	公	110kg	110cm	15cm	15cm	100cm	3	3	3	175+0

## 材料與方法

- 杜洛克(D)、藍瑞斯(L)及約克夏(Y)豬種於新化檢定站進行生長性能檢定至體重110Kg(母100Kg)或160±7日齡。本研究利用201101期至201604期等42期檢定豬隻，總計4,713頭血樣，包括D公2,482頭、D母201頭、L公1,154頭、L母313頭、Y公466頭與Y母97頭。分析在X染色體73cM位置之微衛星標記SY11(骨架基因)交替基因型。
- 檢定合格公豬經由體型評鑑召集人宋永義名譽教授、王佩華評審與賴永裕評審等三人，評選出每期每品種總頭數之33%豬隻為最佳體型種豬，並排名1至5名及優勝。
- 將體型名次視為骨架基因的外表型，分析SY11(骨架基因)交替基因型頻率差異，作為篩除不利基因型依據。

## 結果與討論

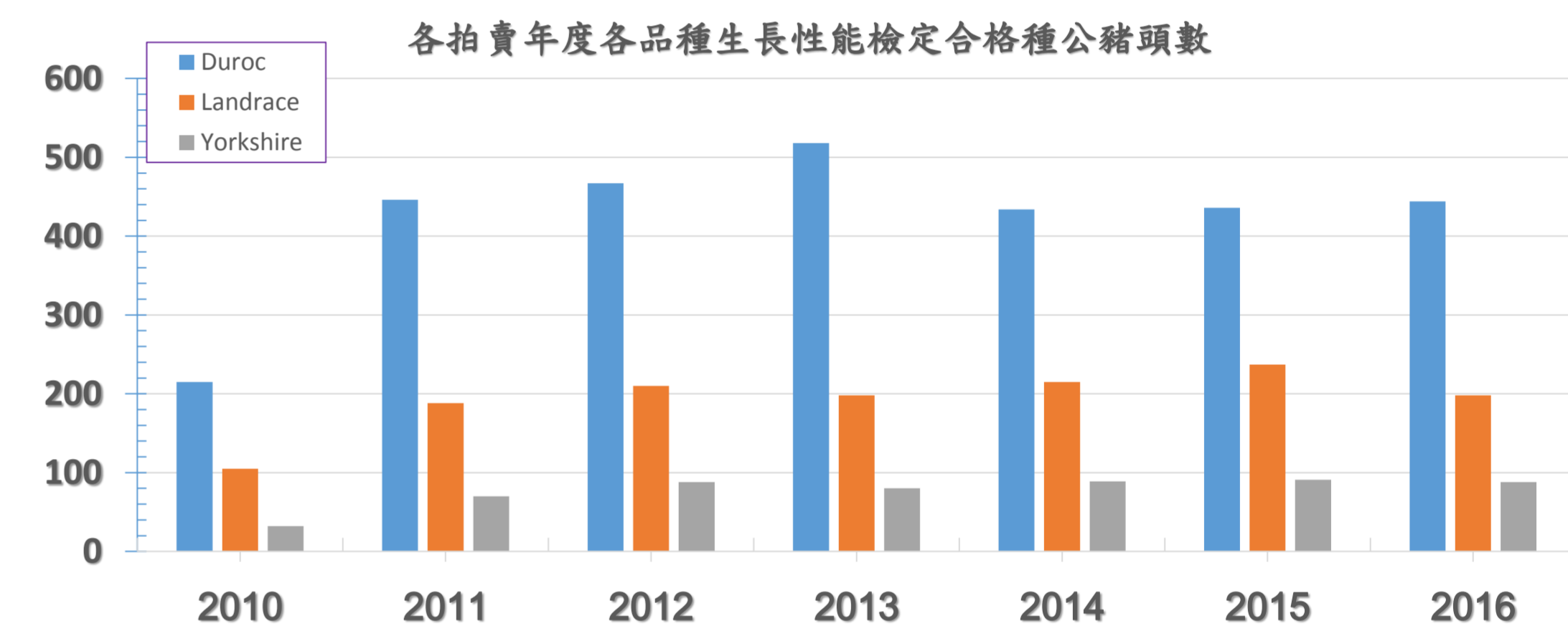
- 骨架基因之交替基因間鹼基數長短(bp)依序有161~177bp等9個交替基因。
- 品種及性別差異上，使用拍賣成交頭數最多的兩種基因型(鹼基數)來標示，在D公是175+0及171+0、D母是171+4及175+0、L公是171+0及167+0、L母是167+4及171+0、Y公是171+0及169+0與Y母是171+0及169+2。
- 不分性別，骨架基因之交替基因在D品種以175、171及167bp居多；L品種以171及167bp居多；Y品種以171及169bp居多。
- 每期檢定合格種豬經體型評級，取各品種各性別之體型高大冠軍豬各一頭，總計204頭。體型高大冠軍豬性染色體的骨架基因交替基因型在D、L、Y品種分別為175+0、171+0、171+0居多

Association analysis of conformation contest to skeletal integrity gene on chromosome X and Y from purebred pigs under growth performance test

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Duroc (D), Yorkshire (Y) and Landrace (L) pigs were tested for growth performance at Hsinhua Station. The off-tested age was on the weight of 110kg (100kg for gilt) or by 160±7 days of age. A total of 4,713 pig blood samples was collected during the sum of 42 classes from class 201101 to class 201604, in which were 2,482 D boars, 201 D gilts, 1,154 L boars, 313 L gilts, 466 Y boars and 97 Y gilts. Genetic marker of SY11 on chromosome X located at 73cM was designated as the skeletal integrity gene. The variation of DNA fragment size of 9 fragments were 161~177bp with a 2bp difference in size. Analysis on allelic variants in various breed and gender by using a higher pig head sold in auction, there were 175+0 and 171+0 genotypes in D boars, 171+4 and 175+0 genotypes in D gilts, 171+0 and 167+0 genotypes in L boars, 167+4 and 171+0 genotypes in L gilts, 171+0 and 169+0 genotypes in Y boars, 171+0 and 169+2 genotypes in Y gilts. Major allelic variants of skeletal integrity gene regardless of gender were 175, 171 and 167bp in D, 171 and 167bp in L, and 171 and 169bp in Y, respectively. Conformation contest was carried out in each class to select objectively a champion of tall pig in each breed and each gender, hence, a total of 204 head of champion pig with a tall conformation was selected. The major allelic genotype for those of tall champion pigs were shown as 175+0, 171+0 and 171+0 in D, L and Y, respectively. Utilization of allelic variants of the skeletal integrity gene on sexual chromosome as gene barcodes with conformation data to select tall pig lines within breed, it could be beneficial to establish genomic databank on gene-linked economic trait for conformation selection of tall pig breeds.

Key Words: Breeding pig, Genetic marker, Conformation contest.



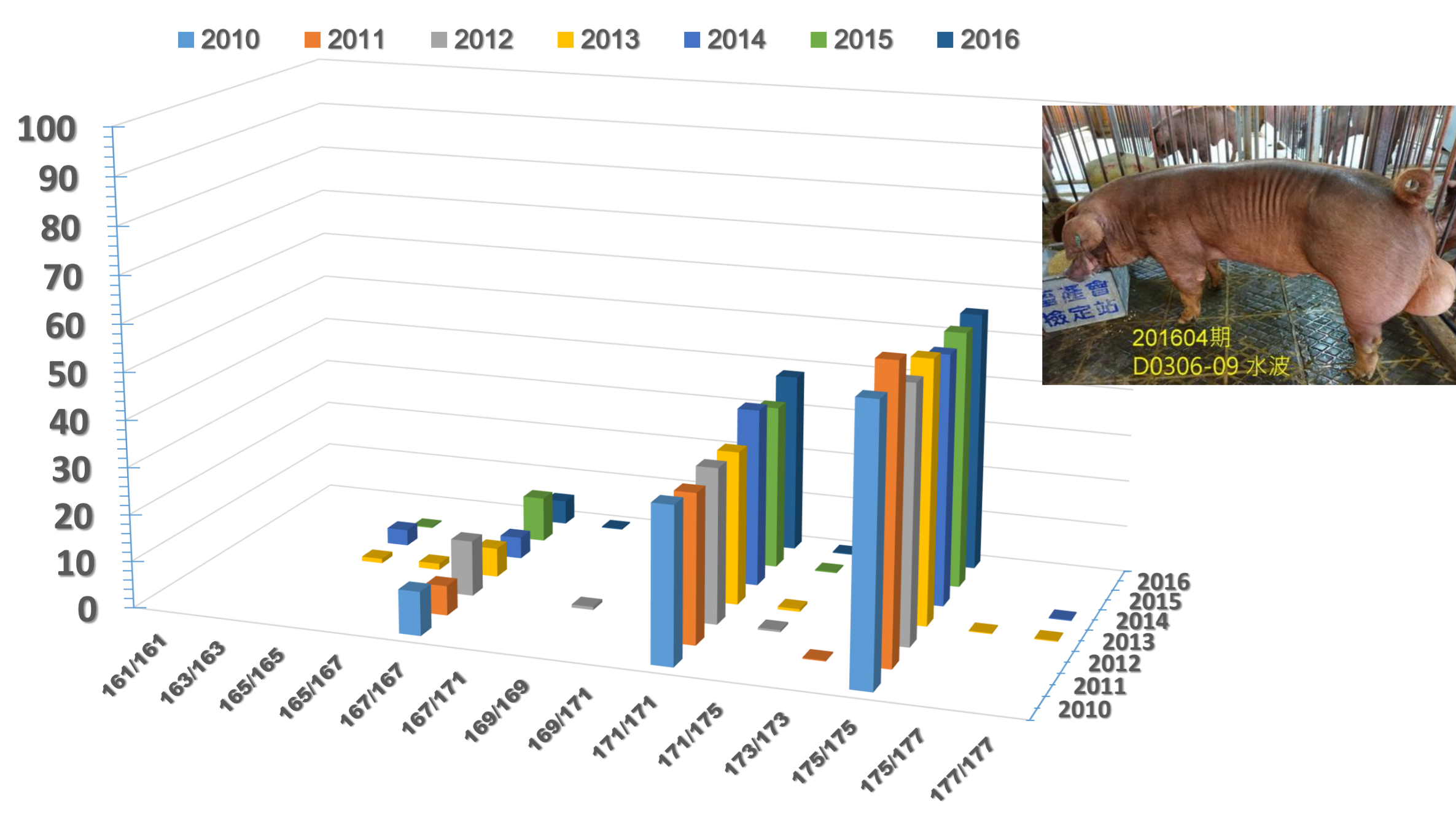
## 體型第一名之評語

頭頸：比例小，頸收連接順  
體軀：中軀伸長，胸部深，胸部闊，肋骨開張  
四肢：步伐輕快，繫帶強，管徑適粗，蹄型佳，後視寬深，後腿寬  
尾根：位置高  
性器外觀：發育良好

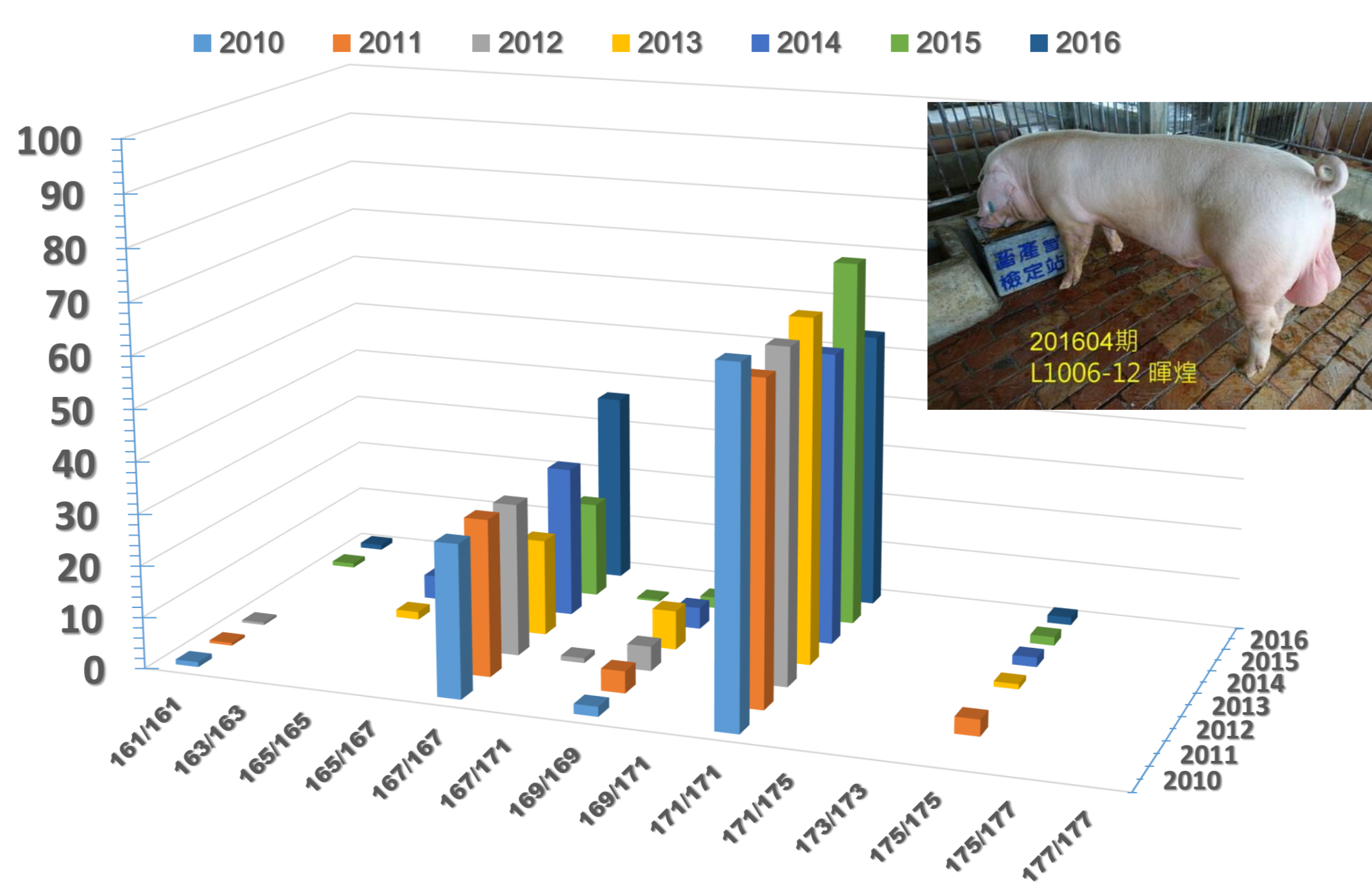
## 研究方向

應用基因條碼及體型資料作為品種內高大體型選拔品系選育用，有利於高大型種豬經濟性狀基因標記建置及選種。

Genotype Frequency of SY11 in Duroc Boar from 2010 to 2016



Genotype Frequency of SY11 in Landrace Boar from 2010 to 2016



Genotype Frequency of SY11 in Yorkshire Boar from 2010 to 2016

