

Development and application of microsatellite markers in selecting genes for prolificacy and other positive traits of swine

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INTRODUCTION

Reproductive performance of individual sows
 -indicator for breeding herd efficiency
 -improvement is limited by traditional selection due to low heritability

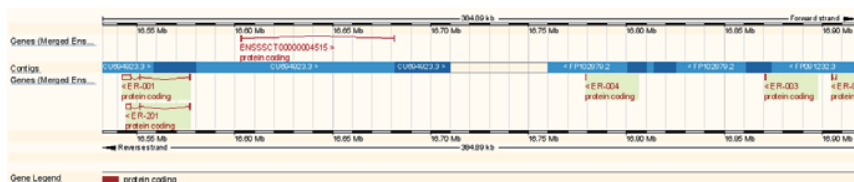
With the use of genetic marker in breeding program
 -the inheritance of selected genes located on segments of chromosomes
 -can be traced from parents to offspring

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INTRODUCTION

ESR (estrogen receptor)
 -marker for litter size (Rothschild et al., 1991)
 -applied in commercial level to increase the number of piglets



INTRODUCTION

MYOG (myogenin)
 -belongs to the MyoD gene family that controls the muscle fiber formation or myogenesis during embryonic development
 -the number of myofibers is positively correlated with growth rate and muscle mass gain in pigs ((Ernst et al., 1993; Mendez et al., 1997; Soumilion et al., 1997).





OBJECTIVES

General Objectives

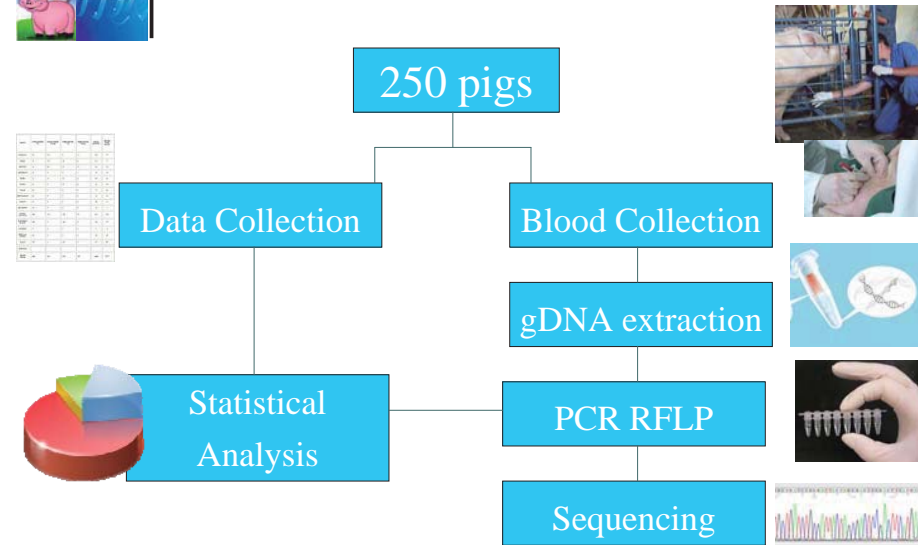
The proposed R&D program that will be implemented thru private-public partnership aspires to increase productivity and improve production efficiency of the Philippine swine industry through the application of gene marker technology in breeding and selection.

Specific objectives

1. Identify genetic markers associated to prolificacy and other positive production traits from local breeder pig populations.
2. Develop genetic evaluation protocols for the identification of individual breeder pigs that are carriers of prolificacy and other positive genes.
3. Promote the adoption of molecular methods of selection by local swine raiser to improve prolificacy and production efficiency thru the establishment of a private-sector operated swine genomics service laboratory.



MATERIALS AND METHODS



GENE: Estrogen Receptor (ESR)

Number of samples genotypes: 224

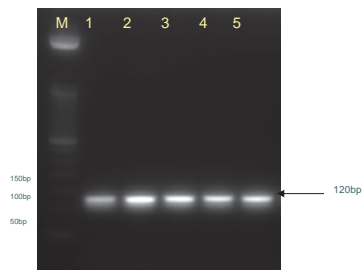


Figure 1. PCR product using ESR gene marker with product size of 120 bp. M – marker, Lane 1-5 – Samples

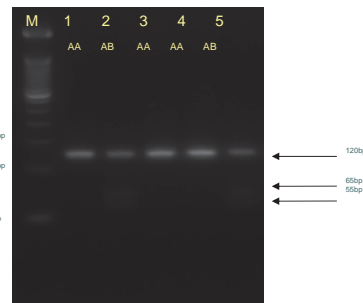


Figure 2. Agarose gel result after *PvuII* digestion.



GENE: Estrogen Receptor (ESR)

Number of samples genotypes: 224

GENOTYPE	Number of samples
AA	134
AB	90
BB	0
TOTAL	224



ESR

The presence of **allele B** of ESR gene
 -positively correlated to litter size in swine
 -this beneficial allele B
 -a C to T transition in intron of pig
 chromosome 1.



GENE:Myogenin (MYOG)

Number of samples genotypes:237

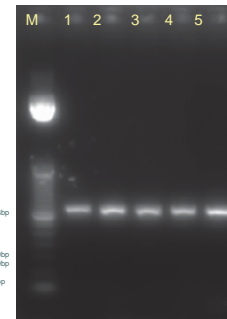


Figure 3. PCR product using MYOG gene marker with product size of 353 bp. M – marker, Lane 1-5 – Samples

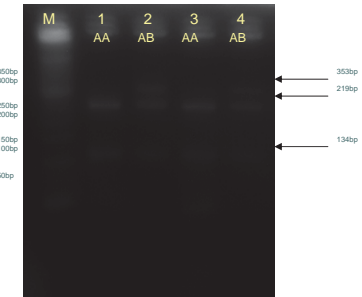


Figure 4. Agarose gel result after MspI digestion..



GENE:Myogenin (MYOG)

Number of samples genotypes:237

GENOTYPE	Number of samples
AA	214
AB	23
BB	0
TOTAL	237



MYOG

The presence of allele A of myogenin gene
 -favors the growth rate and the muscle mass
 of the animal
 -this beneficial allele A
 -a T to C transition in exon 1 of pig
 chromosome 9.



FUTURE PLANS

TARGET GENE	FUNCTION
Murine Coxsackievirus and Adenovirus Receptor Gene (Mcar)	associated to loin meat quality and intramuscular fat
Calpastatin (CAST)	for carcass quality
Heart-type fatty acid binding protein (H-FABP)	associated with intramuscular fat
Leptin Receptor(LEPR)	for carcass/meat quality



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THANKS
FOR
LISTENING