

# Identification Polymorphism of Pituitary-Specific Positive Transcription Factor 1(Pit1) Gene in Indonesian Swamp Buffalo (*Bubalus bubalis*) and Holstein-Friesian Cows



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# INTRODUCTION

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# introduction



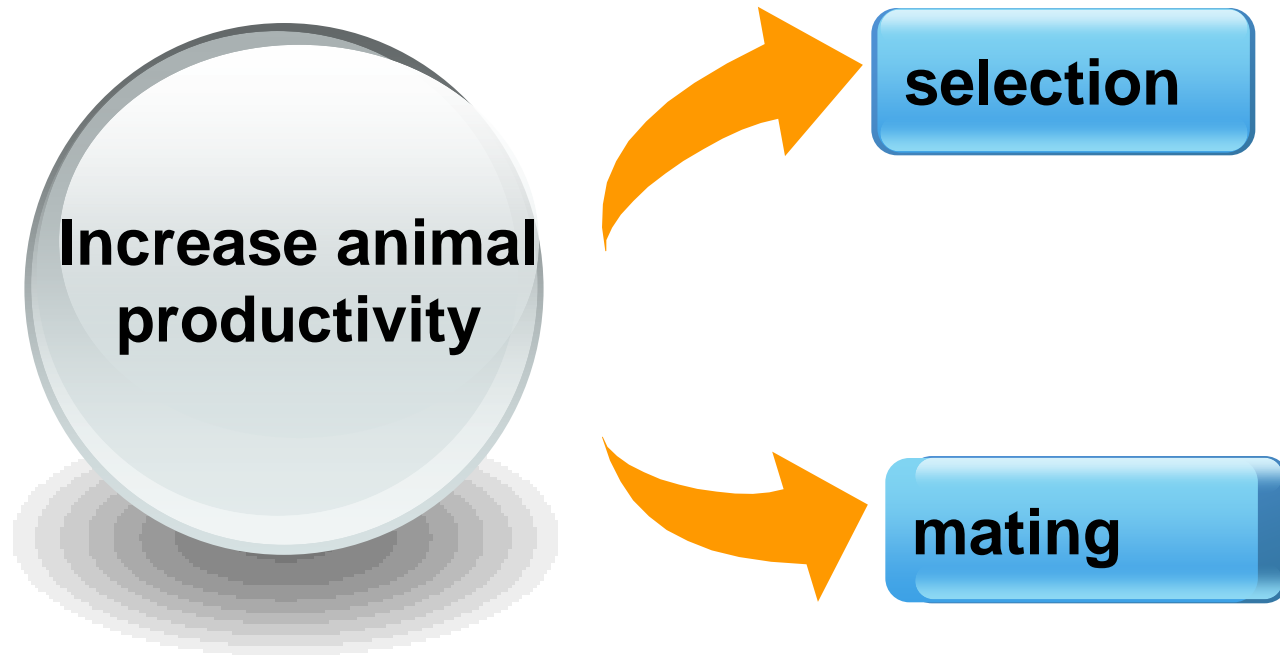
Province	Buffalo population
NAD	340 031
North Sumatra	261 308
West sumatra	211. 008

95 %

Conventional farming



# introduction





# introduction

- ❖ Selection of animals with higher growth rate and better carcass composition is of great significance to breeders and consumers.
- ❖ Current technologies enable scientists to improve on the accuracy and efficiency of traditional selection methods by applying genetic markers through marker-assisted selection.
- ❖ Pit1 gene are among the genes involved in mammalian productivity

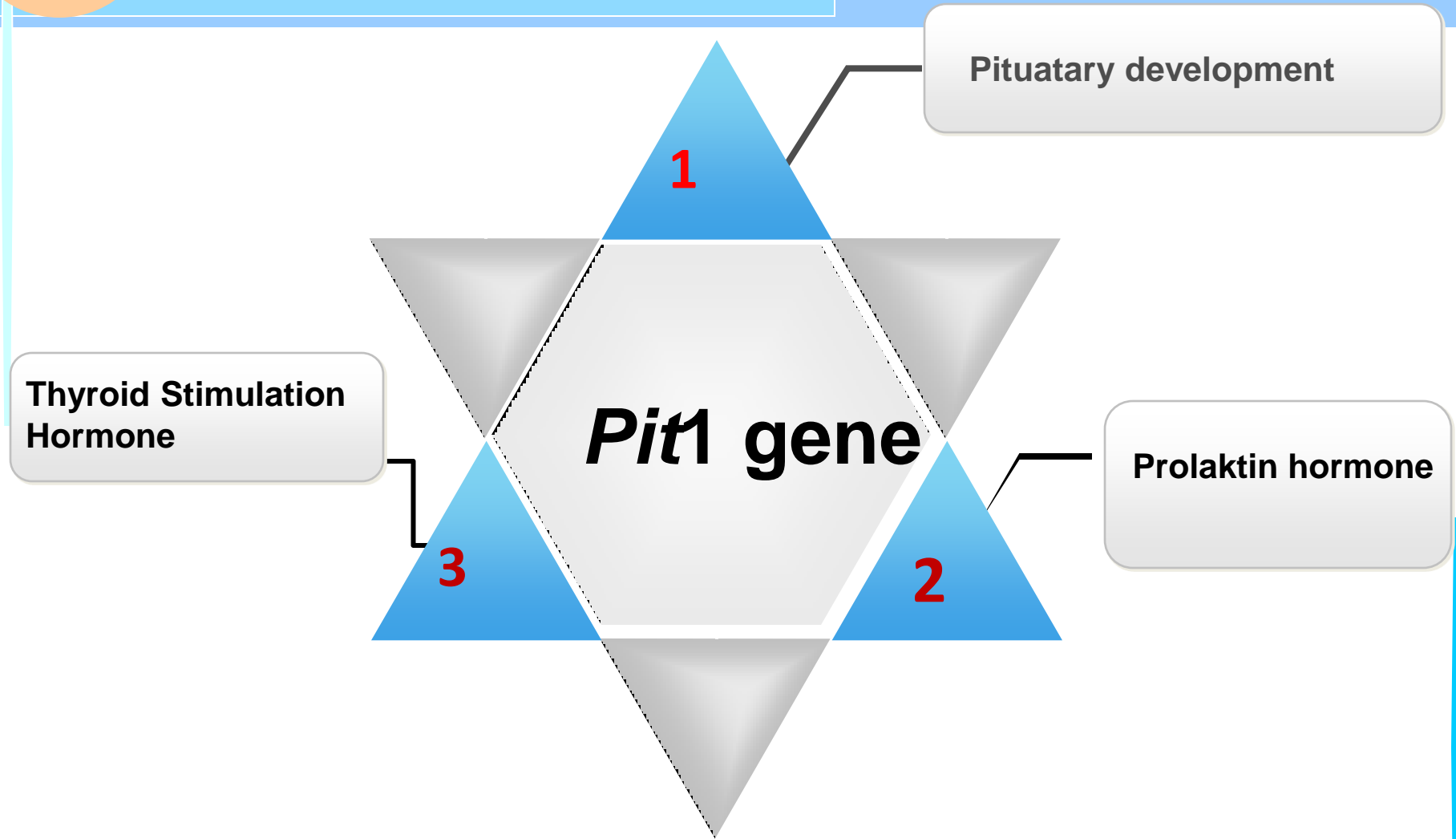


# introduction

- ❖ Gene Pit1 there is in the chromosom 1 , consisting 6 exon and 5 intron
- ❖ Moody *et al* (1995) identified in bovines the A and B alleles of the Pit1/Hinf I polymorphism, which is an exon 6, A to G silent mutation of the bovine Pit1 gene



# introduction





# introduction

The aim of this research to identify the Pit-1-Hinfl polymorphisms and estimate allelic and genotypic frequencies in Indonesian swamp buffalo and FH cows.



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# METHODS

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# Material (whole blood Sampel)

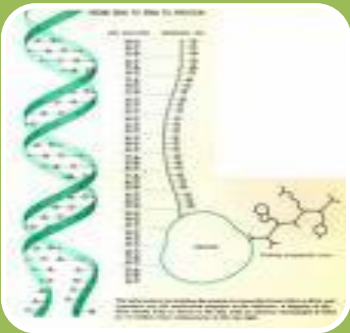
No	Individual	Number	Location
1	Buffalo	75	Central Java
2	Buffalo	103	NTB
3	Buffalo	65	Siborong-borong
4	Buffalo	77	Banten
5	FH Cows	5	Ngantang
6	FH Cows	5	Boyolali
7	FH Cows	5	BET
8	FH Cows	5	KPSBU
9	FH Cows	5	BPPT
10	FH Cows	5	Bali
11	FH Cows	5	Kunak
12	FH Cows	5	Singosari
13	FH Cows	5	Pasir kemis



# Material (PCR)



- Enzym Taq Polymerase and buffer

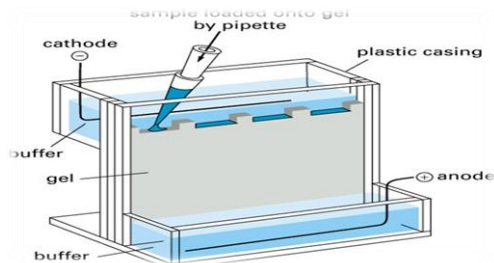
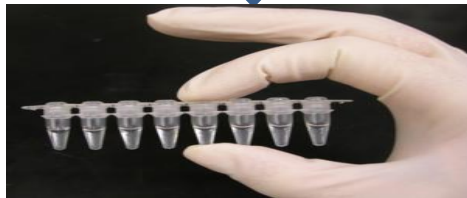


Primer (Javanmard *et al.*, 2005)

- *Pit1F* 5'-GAGCCTACATGAGACAAGCATC-3'
- *Pit1R* 5'-AAATGTACAATGTGCCTTCTGA-3'



# Material and Method



Extraction



PCR



PCR-RFLP



Silver Staining



# Data Analysis

The allelic frequencies were calculated by Nei (1987)

$$Y_i = (2n_{ii} + \sum n_{ij}) / (2N)$$

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**RESULT**

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## Result and discussion

The amplification of the pit1 gene fragment resulted in a single product of 611 bp. In homozygous animals shows ( 611bp, AA variants) or two bands (367 bp and 244 bp, BB variant). Heterozygous animal gave a three band (611, 367 and 244 bp)



# Result and discussion

Figure 1 shows the restriction pattern of three genotypes AA, AB and BB upon digestion of the *PIT-1* *HinfI* in FH cows

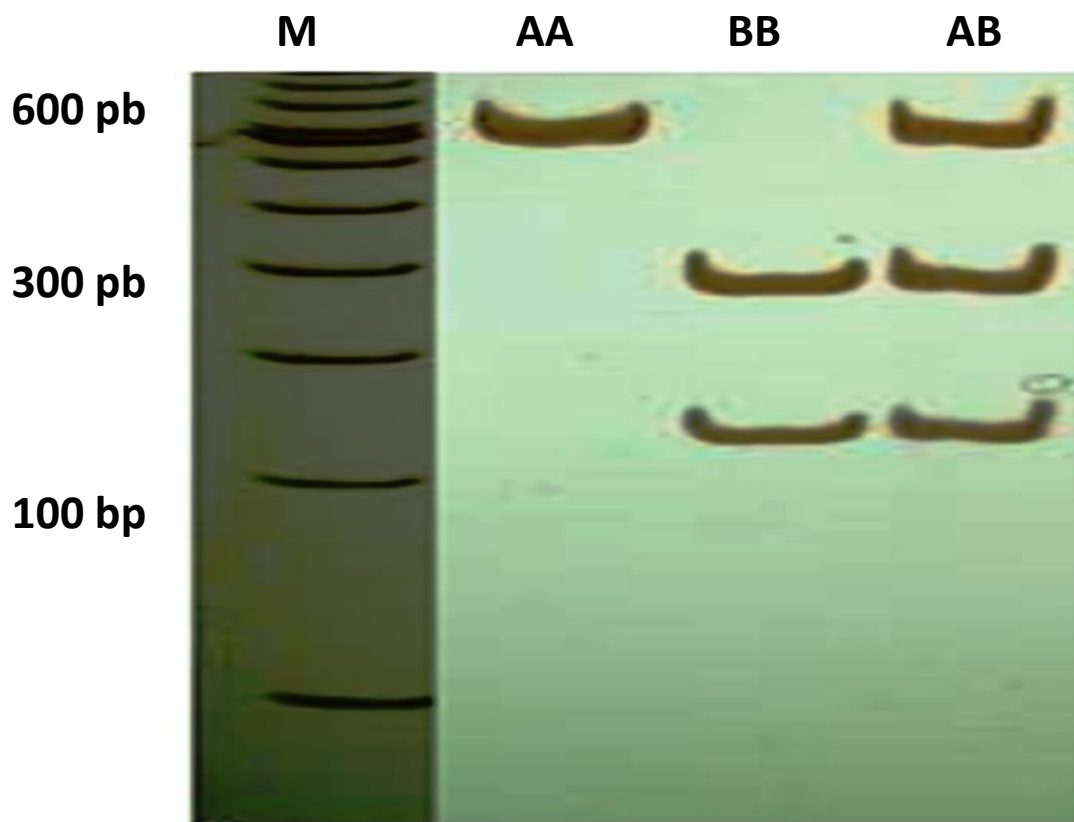
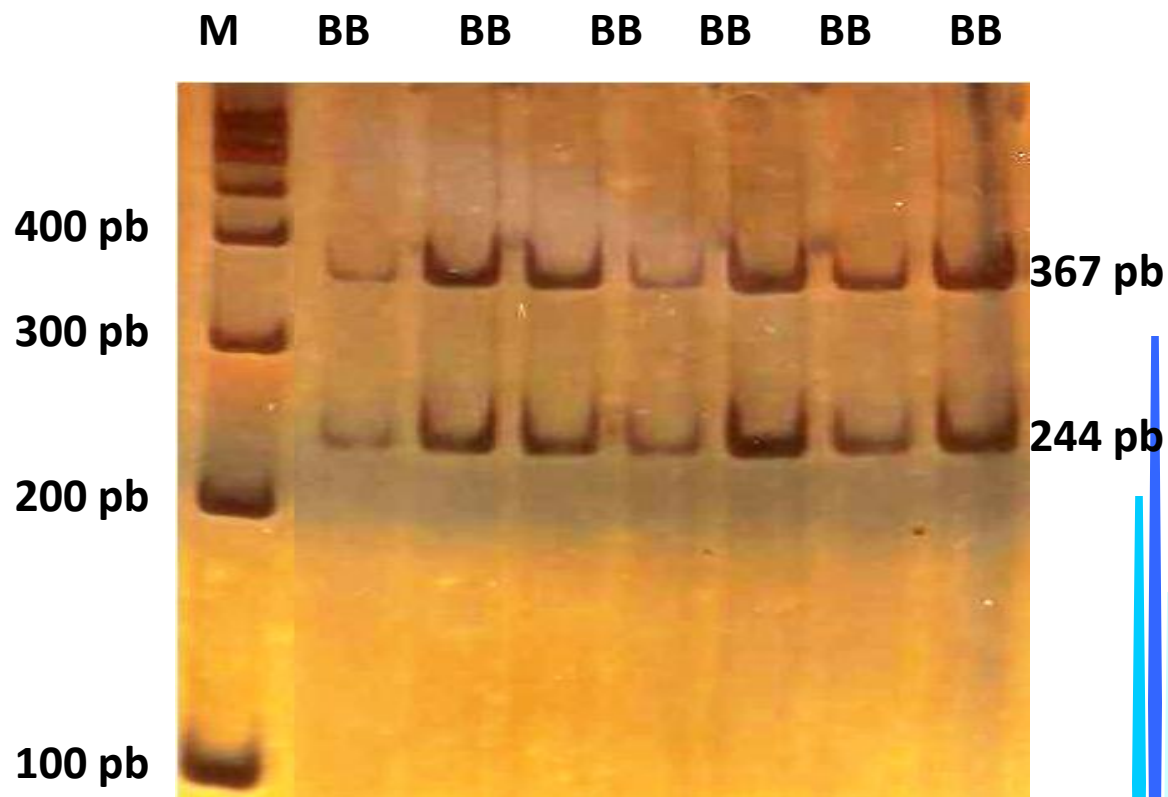








Figure 1 shows the restriction of the *PIT-1* *HinfI* in swamp buffalo



In 320 buffalo analyzed, the overall genotype frequencies were BB (100%)



# Result and discussion

## Genotype and gen frequencies of Pit1-Hinf1 in Buffalo population

location	number	Genotype frequencies			alel	
		AA	AB	BB	A	B
NTB	103	0,00	0,00	103(1,00)	0,00	1,00
Central java	75	0,00	0,00	75 (1,00)	0,00	1,00
Medan	65	0,00	0,00	65 (1,00)	0,00	1,00
Total	243	0,00	0,00	243(1,00)	0,00	1,00



# Result and discussion

## Genotype and gen frequencies of Pit1-Hinf1 in FH cows

location	N	Genotype frequencies			Allele frequency	
		AA	AB	BB	A	B
Ngantang	5	0 (0,00)	1 (0,2)	4 (0,8)	0,1	0,9
Boyolali	5	0 (0,00)	1 (0,2)	4 (0,8)	0,1	0,9
BET	5	0 (0,00)	2 (0,4)	3 (0,6)	0,2	0,8
KPSBU	5	0 (0,00)	2 (0,4)	3 (0,6)	0,2	0,8
BPPT	5	0 (0,00)	3 (0,6)	2 (0,4)	0,3	0,7
Bali	5	0 (0,00)	3 (0,6)	2 (0,4)	0,3	0,7
Kunak	5	1 (0,2)	1 (0,2)	3 (0,6)	0,3	0,7
Singosari	5	0 (0,0)	4 (0,8)	1 (0,2)	0,4	0,6
Pasir Kemis	5	0 (0,0)	3 (0,6)	2 (0,4)	0,3	0,7
Total	45	1 (0,02)	20 (0,44)	24 (0,53)	0,25	0,75



# Result and Discussion

**B allele frequency is highest than A allele**

**Allel A in Pit1 locus positively affected milk production  
(Renaville et al., 1993)**

**Alel B for body depth and angularity**



## conclusion

Frequency of B allele is highest than A allele. In Indonesian swamp buffalo, the overall genotype frequencies were BB (100%), but in 45 FH analyzed, genotype frequencies were 0,02 for AA, 0,44 for AB, and 0,53 for BB. Gene frequencies of allele A and B were 0,25 and 0,75, respectively.

Thank you



