GENETIC STUDIES ON TYPE TRAITS IN HOLSTEIN COWS

By

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Approval Sheet

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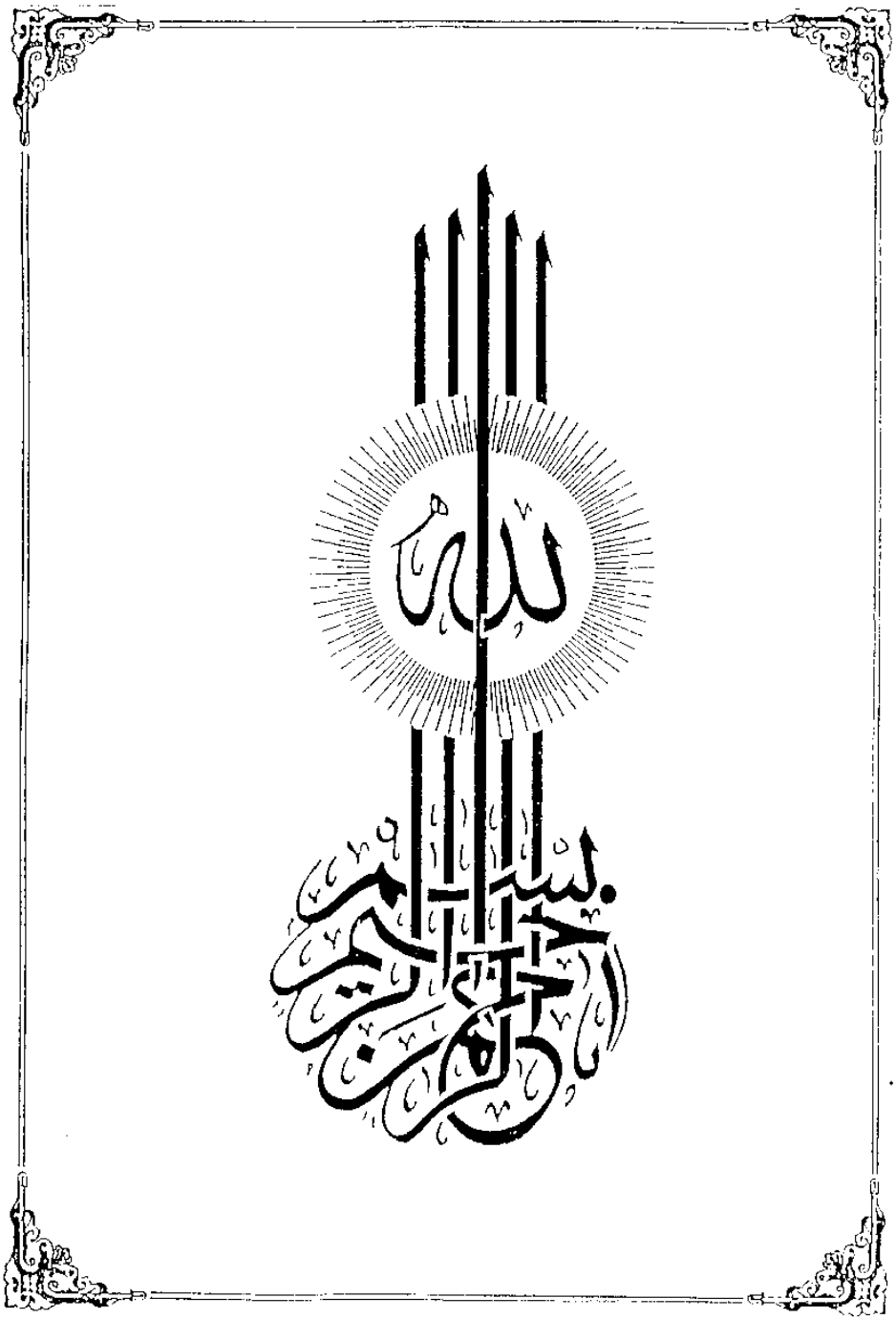

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ABSTRACT

Data on linear type scores for 20 traits were evaluated by Holstein Association from January 1983 to December 1985. Data for analysis were 7090 records by 214 sires, each had on the average 33 progeney in 2705 herds. Data were deviated from herd-year-month and analyzed by mixed model containing sire, stage of lactation and age at measuring. Heritabilities, phenotypic and genetic correlations were estimated and used in a method of the multivariate analysis called the factor analysis in trying to reduce the number of the 20 type traits. The gain from direct and indirect selection was also estimated.

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Dedication

This thesis is dedicated to who has provided me with the stimulating environment to extend and broaden my understanding of life, taught me the value and meaning of the word and is my example in life.

To my friend

my brother

Hamdy Elsayed

This work is dedicated to him.

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LIST OF ABBREVIATIONS

na.	not available
BFCS	British friesian cattle society
MMB	Milk marketing board
STA	STATURE
STR	STRENGTH
BOD	BODY DEPTH
ANG	ANGULARITY
RAN	Rump angle
RL	Rump length
RW	Rump wedth
RLS	Rear leg set
FAN	Foot angle
FATT	Fore attachment
RUH	Rear udder heigh
RUW	Rear udder width
US	Udder suppo
UD	Udder depth
TRV	Teat rear view
GA	General appearance
DCH	Dairy character
BCA	Body capacity
MS	Mammary system
FS	Final score
PPC_1	The first phenotypic principal component

PF_1	The first phenotypic factor
GPC_1	The first principal component from the genetic correlation matrix
GF_1	The first genetic factor
R^2	Coefficient of determination
C^2	Communality
λ_i	Specific eigen value
FS_i	Specific factor score

INTRODUCTION

Type traits are body measurements to describe and analyze the cow's conformation, so that the breeder may compare his animals and herd with the breed as a whole. These traits have been used extensively to characterize dairy animals and in dairy judging techniques.

Type traits may indicate freedom from disease like udder traits (fore attachment, rear udder height, rear udder width, udder support, udder depth and teat rear view).

Type traits are important if closely related to lactation production or lifetime production and could be used to support selection for milk. These traits are many and it would be in the interest of the breeders to reduce these many traits into as few as possible without losing much information. Therefore, it is the objective of this study to estimate the heritabilities and genetic and phenotypic relationships between 20 type traits and to use the genetic and phenotypic relationships between them to investigate the possibility of reducing the 20 type traits to a lesser number while retaining most of the information contained in the 20 traits, i.e. reducing the number of traits by removing redundancy of information in the original set.