MODELING TO DETERMINE POSSIBLE PROBLEMS IN APPLICATION OF THE ANIMAL MODEL IN DAIRY CATTLE

By

MANAL MOHAMAD AHMED SAYED

B.Sc. Agric. Sci. (Animal Production),

Ain Shams University, 1985

M.Sc. (Animal Breeding)

Ain Shams University, 1989

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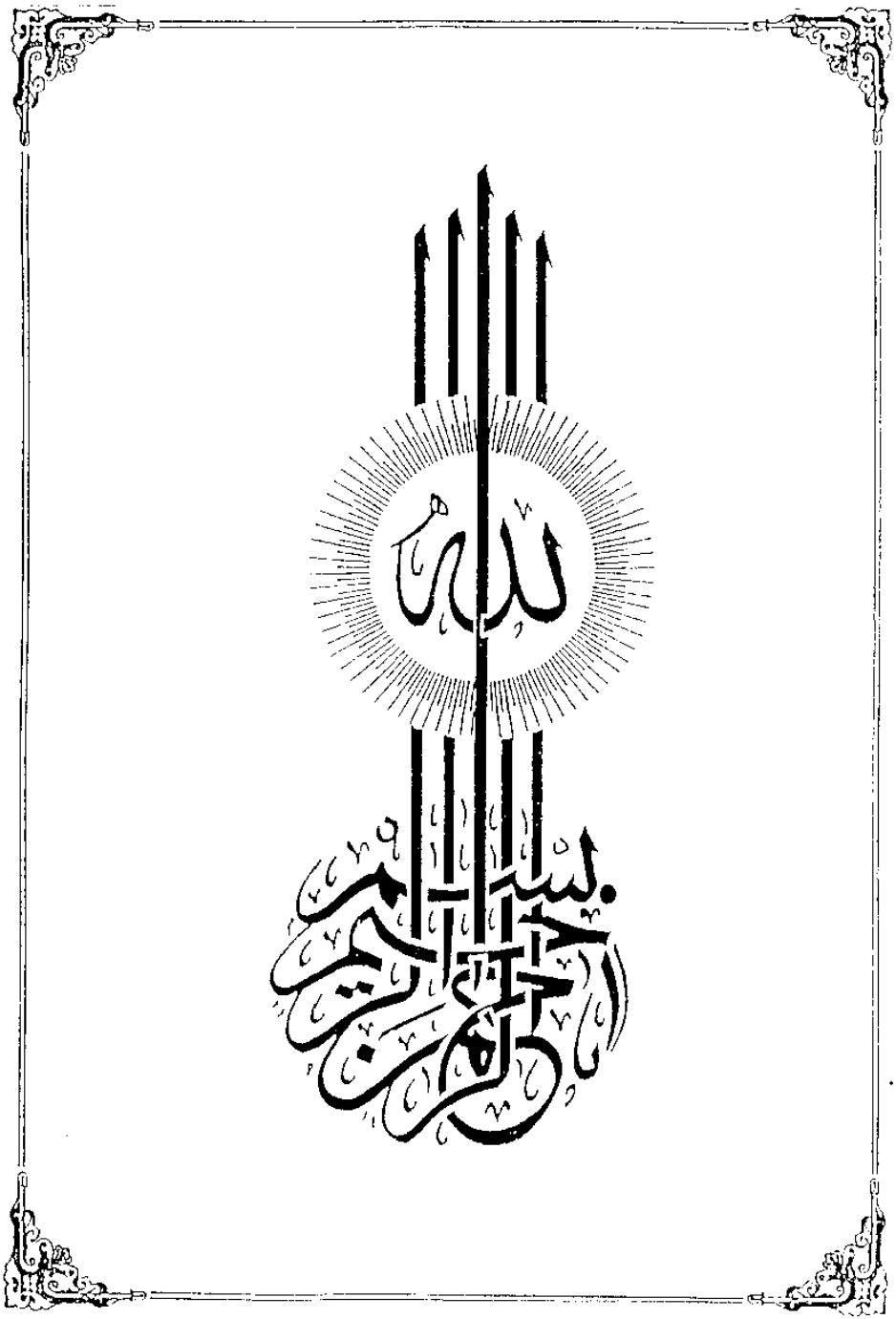
This thesis for Ph.D. degree has been approved by:

Prof. Dr. Ali A. Nigm .....
Prof. of Animal Breeding, Faculty of Agriculture
Cairo University.

Prof. Dr. Ashraf M. Soliman .....
Prof. of Animal Breeding, Faculty of Agriculture
Al-Zagazig University.

Prof. Dr. Hussein M. Mansour .....
Prof. of Animal Breeding. Faculty of Agriculture
Ain Shams University.

Date of examination: 17/9 / 1997



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This thesis is dedicated with all my love to the only person in the world that I wish to see him better than me, my kid Abd El-Rahman. Nothing could satisfy my feeling toward his lovely smile which stand by me at time needed.

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Ain Shams University, 1989

Under the supervision of:

Prof. Dr. H. M. Mansour

Prof. of Animal Breeding, Fac. of Agric., Ain Shams Univ.

Prof. Dr. E. A. El-Tawil

Prof. of Animal Breeding, Fac. of Agric., Ain Shams Univ.

ABSTRACT

MANAL MOHAMMAD AHMAD SAYED. Modeling to determine possible problems in application of the animal model in dairy cattle. Unpublished Ph.D., University of Ain Shams, Faculty of Agriculture, Department of Animal Production, 1997.

This thesis was directed to study three problems arise when analyzing animal breeding data for estimating variance components and / or predicting breeding values.

In chapter 1, the effect of different degrees of disconnectedness (50 levels) on estimating variance components was investigated by generating three populations depending on the value of heritability (0.1, 0.25 and 0.4). It was noticed that mean squared errors did not change noticeably by changing the degree of connectedness. Whereas there was a slight decrease in bias by increasing the degree of connectedness.

In chapter 2, the relevance of predicting the breeding value of a trait analyzed as multiple traits versus the prediction using a single trait analysis specially in case of missing values was studied. Results of this chapter indicated that bias was lower when the trait was analyzed by multiple traits analysis than when analyzed using a single trait analysis for the estimation of variance component and for the prediction of breeding values.

Chapter 3, concerned with studying the effect of correction for fixed effect on estimating variance components by four different models. Results indicated that mixed model is the best model to yield constants for correcting fixed effects whereas cow model is the best model for estimating variance components.

Key words: simulation, dairy cattle, disconnectedness, single trait, multiple traits, environmental adjustments, variance components, breeding values, modeling and animal model.

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GLM	general linear model
VAR. COMP.	variance component
SAS	statistical analysis system
PEV	predicted error variance
BV's	breeding values
BLUP	best linear unbiased predictors
yr	year
R^2	coefficient of determination
h^2	heritability
σ^2_a	genetic variance
σ^2_e	environmental variance
σ^2_p	phenotypic variance
MSE	mean squared errors
DC	degree of connectedness
LSMLMW	least square maximum likelihood mean weighted
MTDFREML	multiple traits derivative free restricted maximum likelihood
kg	kilogram