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IMPROVING BEEF PRODUCTION IN BRAZIL USING SELECTION AND CROSSBREEDING

A thesis presented in partial
fulfillment of the requirements for
the degree of Master of Applied
Science in Animal Science
at

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Palmerston North
New Zealand

MAURO LORDES PEREIRA

2001

MAR SALGADO

Ó mar salgado, quanto do teu sal
São lágrimas de Portugal!
Por te cruzarmos, quantas mães choraram,
Quantos filhos em vão rezaram!

Quantas noivas ficaram por casar
Para que fosses nosso, ó mar!
Valeu a pena? Tudo vale a pena
Se a alma não é pequena.

Quem quere passar além do Bojador
Tem que passar além da dor.
Deus ao mar o perigo e o abismo deu,
Mas nele é que espelhou o céu.

Fernando Pessoa

Extraido da obra poética Mensagen
de Fernando Pessoa

PORTUGUESE SEA

Salt-laden sea, how much of all your salt
Is tears of Portugal!
For us to cross you, how many sons have kept
Vigil in vain, and mothers wept!
Lived as old maids how many brides-to-be
Till death, that you might be ours, sea!

Was it worth? It is worth while, all,
If the soul is not small.
Whoever means to sail beyond the Cape
Must double sorrow - no escape.
Peril and abyss has God to the sea given
And yet made it the mirror of heaven

Fernado Pessoa

Mar salgado (Portuguese Sea) translated
into English by J.Griffin from Fernando
Pessoa's 'Mensagem'

Abstract

Beef industry is an important sector of the Brazilian economy. Brazilian beef production is very dependent on pasture, which, in all most its totality, is constituted by tropical forages characterized by abundance during the rain season and low quality and quantity during the dry season. Therefore, efficient beef production systems would include breeding adapted genotypes rather than attemptig large changes in the environment. As a result, animal breeding becomes a very important agent within beef production.

This project intended to investigate throughout computer modeling the effects of different breeding schemes applied to a hierarchical integrate beef production system, involving a three straight bred herds nucleus and a three-breed terminal crossing commercial herd. The study simulated a tropical system of production based on common Brazilian management practices and parameters published in the literature related to beef production on tropical and subtropical climates. A deterministic procedure was applied to develop a model for a hierarchical integrated beef production system involving a crossbred commercial herd and three straight-bred nucleus herds and it was developed on an annual basis using a Microsoft Excel spreadsheet.

Economic selection index methodology was applied to develop different selection indexes. The model was used first to estimate economic values for biological traits affecting returns and costs. A breeding objective was established based on economic values of traits that would significantly

affect profitability of the production system. Basically there were two different scenarios that were tested. One scenario investigated the results of 20 years of selection taking in account the use of progeny tested bulls while the other scenario would investigated the outcomes of selection based only on individual selection of the bulls. Subsequently, the model was used to investigate which economic values would maximize profit per animal unit.

The two selection indexes that included information of progeny into the selection criteria were the best ones when compared to the selection indexes using individual selection independently of the relative economic values applied. The maximizing profit AU relative economic value selection index presented the best improvement in profit per AU, which was also followed by a higher profit per hectare and return rates.

Economic selection index proved to be an efficient tool to change profit since breeding schemes improved profit in all scenarios independent from the relative economic value applied or if information from progeny was included or not in the index. The adoption of progeny testing in breeding programs proved to be more effective than individual selection on a long-term basis. The advantage of selection indexes including progeny was to promote a greater increase in dressing out percentage and a lower change on mature size of the breeding cows.

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