

**NUTRIENT REQUIREMENTS OF ZEBU
BEEF CATTLE**

BR - CORTE

2nd Edition

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PREFACE

The Brazilian beef cattle industry is established as one of the largest sectors of Brazilian agriculture, accounting for a substantial percentage of agricultural gross domestic product (GDP) in 2009. Moreover, the world financial crises of the first decade of the XXI century revealed the beef producer as a synonymous of survival in the current beef market situation, with raising production and increasing efficiency.

Brazil detains the largest commercial cattle herd in the world with about 171 million heads recorded by the last agricultural census in 2006, although it is believed that this number approaches 200 million head last year. In 2009 was registered slaughter of 27.975 million head, making a total of 6.639 million tons of carcass. From this total, Brazilian Ministry of Agriculture reported that exports last year reached 1.9 million tons of carcass, which corresponds more than 4 billion dollars. Nonetheless, it is known that there was a 20% reduction in exports compared to 2008, caused by the global crisis and export embargoes. Therefore, it is believed a significant increase in exports in coming years, expected to exceed the amount achieved in 2008, in which the participation in agricultural GDP was of 26.5%.

In beef cattle production systems, the feeding costs are very important, since they can correspond 70-90% of total operating costs, depending on the production stage and desired level of performance. Additionally, the nutritional aspect is one of the major factor affecting animal performance. Thus, the search and adoption of more rational feeding management strategies have the potential to produce huge economic and quality impacts on beef production. Technologies to be used in our country, in the agriculture field, obviously must be developed in Brazil, where the composition of the herd, the available feed and the climate are typical and unique to tropical environment.

Once the composition of feeds and their nutritional value are known, the nutritional requirements can be met with more efficacy. The milestone of nutritional requirements in Brazil occurred in 1980, with the publication of the first Ph.D. thesis by Malvino Salvador, under advisement of Professor José Fernando Coelho da Silva. At the same time, began the requirements researches in Piracicaba, under advisement of Professor Celso Boin.

Considering the need to improve animal performance, profitability, and diet and supplement formulation to certain levels of performance, as well as to estimate the performance from a given diet, only in 2006 it was published the first version of table of nutrient requirements of Zebu, with the composition of some feeds, named BR-CORTE, which used data from nutrient requirements trials in Brazil with Nellore of different gender.

As the first version of the nutrient requirements tables included only Nellore and considering that over the past four years there was an increasing number of data, the second version of Brazilian Tables of Nutrient Requirements was elaborated, including several improvements which will be briefly described below, principally the inclusion of crossbred Zebu with *Bos taurus* and cattle finished under pasture conditions. Also, it was removed the feed composition chapter due its publication as a distinct table. It was included two new chapters on the table, one for estimating the energy value of diets based on feed composition and another regarding the nutritional requirements of energy, protein and minerals for lactating Nellore cows and their calves from 0 to 180 days of age.

In all new chapters, when it was possible, we have included a meta-analysis, to account for the effect of study, and evaluated the effect of crossing (pure versus crossbred zebu) and sexual class (bulls, steers or heifers), as well as present data separately for cattle finished in feedlot or under pasture conditions.

It was observed the genetic group effect in equations to estimate dry matter intake, and thus it was recommended different equations for Nelore and crossbred. It was not observed any effect of production system (dairy cattle x beef cattle) for microbial efficiency and thus it was maintained the same as the previous version (BR-CORTE, 2006).

Considering the increase in the number of observations, it was developed new equations to estimate carcass and empty body composition using not only the 9-11 rib section, but also including other variables in the model, mainly the visceral fat. Equations were proposed to estimate the composition of non-carcass components. Also in this edition, there was no effect of breed or sex condition on the energy requirements for maintenance, but those were higher for cattle finished in pasture. New equations were developed to estimate the efficiency of utilization of metabolizable energy for maintenance and gain.

The protein requirements for maintenance were also higher for animals raised on pasture and it was developed an equation to estimate the efficiency of utilization of metabolizable protein for gain.

In this edition it was also reviewed the mineral requirements, being recommended some equations developed in Brazil to estimate the requirements of macrominerals for maintenance and the absorption coefficients, and additionally a discussion about the use of allometric equations to estimate the mineral requirements for gain.

In this manner, we hope that the update of nutrient requirements tables, increasing knowledge of nutritional requirements, may represent a breakthrough in ration formulation, contributing to the economy of production systems of beef cattle and to reduce the excretion of nutrients that increases environmental pollution. We also wish that an analysis of published results may guide research to solve the issues that still need more or new knowledge.

The authors.

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CONTENT

PREDICTION OF DRY MATTER INTAKE BY CATTLE IN FEEDLOT	1
<i>José Augusto Gomes Azevêdo, Sebastião de Campos Valadares Filho, Douglas dos Santos Pina, Rilene Ferreira Diniz Valadares, Edenio Detmann</i>	
RUMINAL FEED PROTEIN DEGRADATION AND MICROBIAL PROTEIN SYNTHESIS	13
<i>Douglas dos Santos Pina, Rilene Ferreira Diniz Valadares, Sebastião de Campos Valadares Filho, Mario Luiz Chizzotti</i>	
PREDICTION OF THE ENERGY VALUE OF CATTLE DIETS BASED ON THE CHEMICAL COMPOSITION OF FEEDS	45
<i>Edenio Detmann, Sebastião de Campos Valadares Filho, Mário Fonseca Paulino</i>	
PREDICTION OF BODY AND CARCASS CHEMICAL COMPOSITION OF PUREBRED AND CROSSBRED NELLORE CATTLE	61
<i>Marcos Inácio Marcondes, Pedro Veiga Rodrigues Paulino, Sebastião de Campos Valadares Filho, Mateus Pies Gionbelli, Luiz Fernando Costa e Silva, Luis Orlindo Tedeschi</i>	
ENERGY REQUIREMENTS OF ZEBU BEEF CATTLE	81
<i>Marcos Inácio Marcondes, Mário Luiz Chizzotti, Sebastião de Campos Valadares Filho, Mateus Pies Gionbelli, Pedro Veiga Rodrigues Paulino, Mário Fonseca Paulino</i>	
PROTEIN REQUIREMENTS OF ZEBU BEEF CATTLE	107
<i>Marcos Inácio Marcondes, Mateus Pies Gionbelli, Sebastião de Campos Valadares Filho, Mário Luiz Chizzotti, Mário Fonseca Paulino</i>	
MINERAL REQUIREMENTS OF ZEBU BEEF CATTLE	127
<i>Mateus Pies Gionbelli, Marcos Inácio Marcondes, Sebastião de Campos Valadares Filho, Laura Franco Prados</i>	
NUTRITIONAL REQUIREMENTS OF NELLORE COWS AND CALVES	167
<i>Pedro Veiga Rodrigues Paulino, Mozart Alves Fonseca, Lara Toledo Henriques, Sebastião de Campos Valadares Filho, Edenio Detmann</i>	