

**FED CATTLE MARKETING IN THE SOUTH-EASTERN OF MATO GROSSO  
(BRAZIL): AN ANALYSIS OF BEEF PRODUCERS' PROFILE AND  
TRANSACTIONS COORDINATION**

**Track 1: agri-food chains and institutions**

**ABSTRACT**

The research aims to relate Mato Grosso's south-eastern beef producers to cattle marketing arrangements. The sample was based on interviews with fifty nine cattle producers that live in Rondonópolis (MT). It was ranked ranchers in three categories: (N1) producers that only sell animals for cash and/or for installment (thirty days), (N2) producers that do (N1), but also operate through NPR – Notas Promissórias Rurais and/or CPR – Cédulas de Produto Rural, and (N3) producers that do (N2) and also enroll on forward contracts and/or futures contracts. Based on the analysis of the data it was estimated an Ordered Logit Model in which were found the following relevant variables: property area, SISBOV/ERAS certification, cross-breeding e beef exports. In synthesis, the engagement on more demanding marketing arrangements (N3) and (N2) has positive relationship with the size of the land area, the use of cross-breeding on the cattle, and to beef exports. On the other hand, it was found that SISBOV/ERAS certification has an opposite effect. The hypothesis is that to have that certification enable producers to increase price arbitrage among packers in cash or installment transactions.

Key-words: marketing arrangements, fed cattle, governance

# FED CATTLE MARKETING IN THE SOUTH-EASTERN OF MATO GROSSO (BRAZIL): AN ANALYSIS OF BEEF PRODUCERS' PROFILE AND TRANSACTIONS COORDINATION

## 1 Introduction

The Brazilian beef agribusiness system has an institutional environment in which transactions have low coordination. Transactions are mainly on cash for fed cattle and there is a high degree of uncertainty about packers' default and carcasses' post slaughter classification. On the other hand, quality certification programs that aim to strength coordination have low adherence among producers and industries (Caleman *et al.*, 2003). To face that challenges, new commercialization schemes have arisen: i) cattle associations to pool together inputs acquisitions and to supply fed animals to slaughter; ii) alliances among producers, packers and retailers to marketing brand quality cuts; iii) electronic auction arrangements to marketing animals; iv) exports of live cattle to slaughter abroad (mainly to the Mid-East).

At the same time, there is an increasing trend in market concentration of the packer industry. From 2000 to 2010, several Brazilian packers like Independência, Margem, Quatro Marcos, Mercosul, Bertin, among smaller ones, have been acquired by the three industry captains (JBS, Brasil Foods, Marfrig), or are in legal restructure processes. The dynamics of the Brazilian beef market became more integrated to international supply and production strategies, because of abroad investments undertaken by the leading packers.

Also bovine livestock production faces growing external and domestic pressure for greater environmental sustainability. Retailer chains based on urban centers require traceability safeguards about suppliers' non-deforestation practices and labor standards. Also European Union increased the demands on the Brazilian traceability system (SISBOV-ERAS)

On that strategic scenery, bovine livestock production in Mato Grosso from 2000 to 2010 reached the national leading position on cattle numbers. The growth in Mato Grosso slaughters increased more than the growth in cattle numbers, so that cattle slaughter rate climbed from 10% to 15% (IBGE, 2010). Feeding land capacity was improved by more productive animal and soil practices like (i) nutrition supplementation, (ii) soil fertilization, (iii) breeding genetics. In the same time, Mato Grosso's beef exports reached Brazilian second position and several new factory investments were undertaken.

However, during the last two years (2009 – 2010) most of the packer industries which operate in the State were in financial distress and that resulted in layoffs and defaults to beef producers. Uncertainty has arisen and provided incentives to the restraint of producers' supply to packers. Also feedlots' forward contracts with the industry diminished because of higher fodder costs.

The paper aims to relate the marketing of fed cattle in south-eastern Mato Grosso to production practices at the farm level. The analysis tries to understand the choices of the transactions' governance arrangements between cattle producers and packer industries in order to find the most relevant variables to vertical coordination in Mato Grosso's beef agribusiness system.

## **2 Bovine livestock production in Mato Grosso: history, geography and production indicators**

Bovine livestock in Mato Grosso has a long life which started in the XVII century in the South-Western regions at "Pantanal" wet lands. Afterwards, plain areas of "Cerrado" in the lea of Cuiabá river were occupied by large farms of extensive grazing to supply meat, leather and transport animals to the gold mining activity. In the XX century, rice plantation increased together with bovine grazing and lumber, deforestation of large areas was the combined result of those three activities.

From the 60's forth, cattle-raising in Brazil was grounded on two factors: *brachiária* and *zebu*. Namely the production in the tropical lands was based on extensive grazing on *brachiária* planted soils and by *zebu* Asian breeds, mainly *Nelore* breed (Bonjour *et al*, 2008).

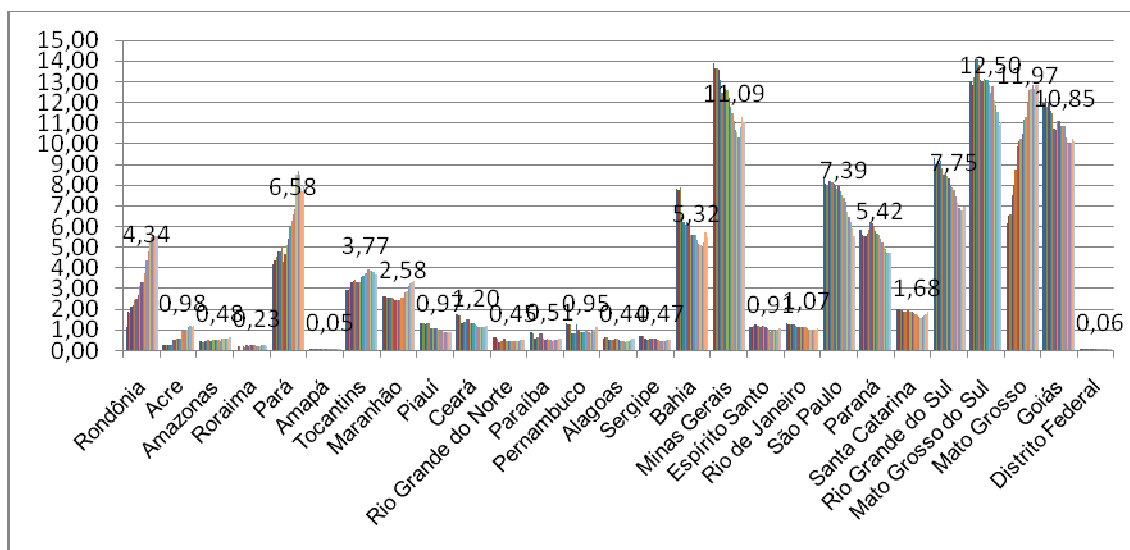
At the same time, the policies of the military regime aimed to the integration of the national territory through highways and the colonization of North and Mid-West regions with mining and agricultural activities. Those activities received the support of financial credits and tax reductions and an agricultural policy to guarantee prices. The Geisel government (1974 – 1979) started the II PND – Second National Development Plan with three programs which worked out to the expansion of the agricultural frontier to the Mid-West region: *PRODOESTE* – Mid-West Development Program, *POLO-CENTRO* – Cerrado Development Program and *PRODECER* – Japan-Brazilian Cerrado Development Program. The government also had pivotal importance to technologic innovation after 1976/77 in Mato Grosso due to EMBRAPA – Brazilian Company of Agriculture Research which worked for the adaptation of plants to the cerrado's weather and soils.

The cattle-raising in 1993 received the support for greater technological innovation by the PROMMEPE – *Mato Grosso's Program to Livestock Improvement* which worked to increase productivity at the farm level. The program was an important device during the 90's and 2000's to provide extension services to upgrade the quality of Mato Grosso's cattle. Also a PROMMEPE's side program called *Cattle Breeding Support Program for Steers*, since 1992 focus on reducing the slaughter age of cattle and improving meat quality by extension and credit policies to enhance steers slaughter (Hamer *et al.*, 2010).

The cattle-raising activity in Mato Grosso amounts to the largest productive land area of the State with 21,8 million hectares. Mato Grosso's grazing lands area is also the largest in the country and between 1980 to 2006 increased at the rate of 47,4%, while Brazilian grazing lands decreased 9,0%. The size of the bovine cattle increased at an even greater rate of 277,8% and reached 19,8 million heads in 2006, while at the same time the growth of the Brazilian cattle was 45,3% (IBGE, 2010).

Among the major cattle producers, the share of Mato Grossos's livestock in Brazil was increasing since 2000 and reached the leadership in that decade (Diagram 1). The performance was due mainly to cattle expansion of 62,9% in the North of the State from 2000 to 2008. That geographical dislocation was the reason of the change in the use of grazing lands to crops in the South and South-East regions of Brazil, that movement occurred also in areas of the Mid-West region due to the increasing soya, cotton and sugar cane plantations.

Diagram 1: States percent participation in the Brazilian cattle: 1990 - 2008

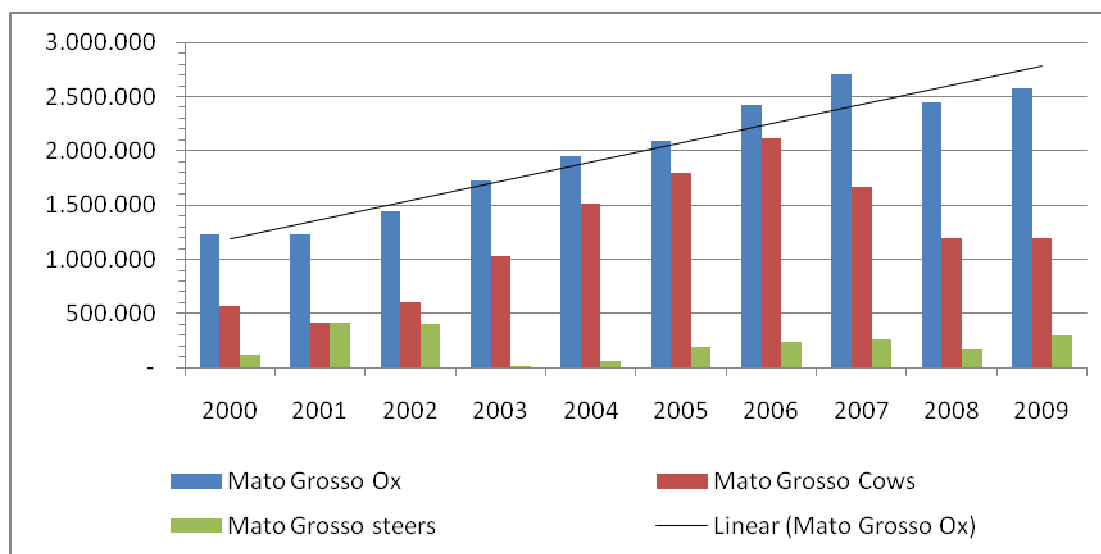


Source: IBGE ( 2010)

Concerning to the production system, cattle raising in Mato Grosso is extensive and based on grazing poor soils, however, in the last ten years there was an increase in supply of nutrition supplementation to cattle (fodder) mainly in the dry season (May to September). More usually cattle raisers do investments in soil fertilization with the use of lime in order to reduce soil acidity. Programs for the improvement in genetics quality of the zebu breeds had also a strong performance in the last decade. The market of artificial insemination picked up and the investments in acquisitions of elite animals for reproduction soared as a result of increasing efforts to improve cattle genetics.

The greater productivity and the opening of new grazing lands, mainly in the North of the State, had as result greater supply of animals to slaughter. The amount of slaughtered heads in Brazil increased 64,4% from 2000 to 2009, while the same indicator to Mato Grosso points to an increase of 111,5% (Diagram 2). Cows' share in the slaughter numbers decreased since 2007, because of the expansion of breeding that took place as a response to higher prices of steers and calves.

Diagram 2: Bovine slaughtered heads in Mato Grosso

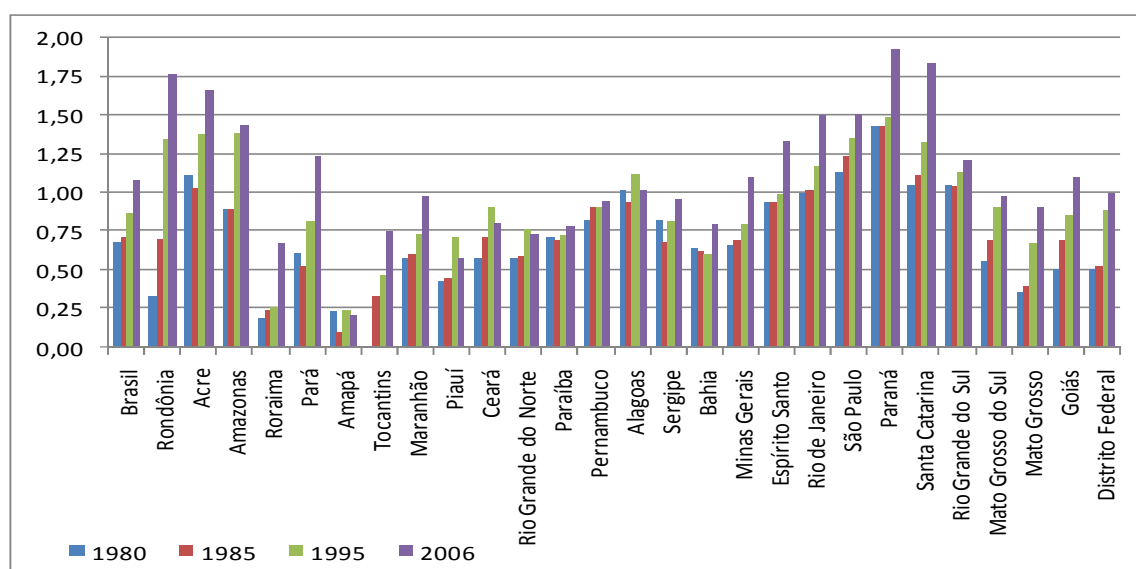


Source: IBGE, 2010

The modernization of livestock handling practices, better feeding inputs, and genetics endorsed greater productivity at the farm level in Mato Grosso. Cattle slaughter rate jumped from 10% in 2000 to 14,8% in 2009 (IBGE, 2010)<sup>1</sup> and the amount of animals per hectare increased from 0,35 head/ha in 1980 to 0,91 head/hectare in 2006. However that indicator is still lower than Brazilian average which is 1,08 head/ha and is lower than other leading States in livestock production like Mato Grosso do Sul, Goiás, Rio Grande do Sul and Minas Gerais (Diagram 3).

<sup>1</sup> Number of slaughtered heads in a year divided by the sum of the cattle heads.

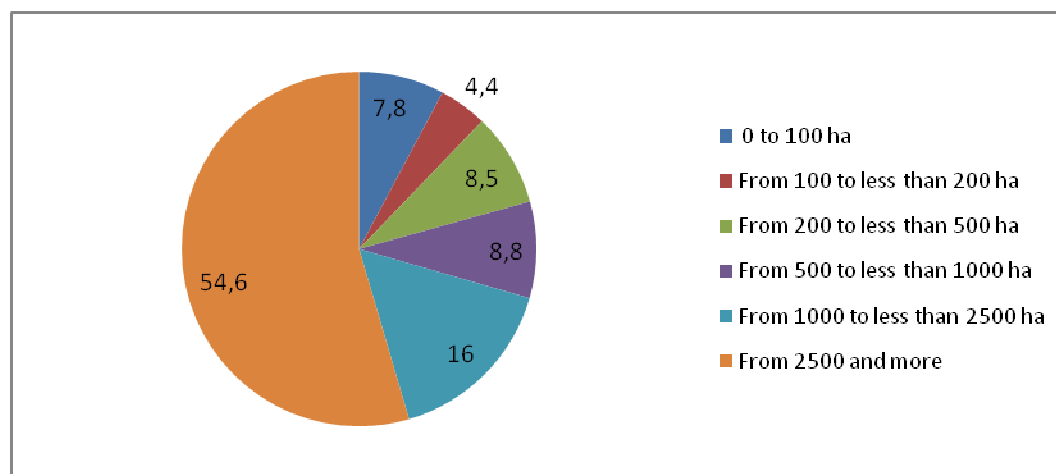
Diagram 3: Heads per Hectare: 1980, 1985, 1995, 2006.



Source: IBGE, 2010

On the other hand, the data on agrarian land distribution shows that 55% of the grazing lands in Mato Grosso are located in farms which are greater than 2500 hectares (IBGE, 2010). It points to the scale of concentration of the livestock activity in the State.

Diagram 6: Grazing lands distribution by property size in Mato Grosso



Fonte: IBGE, 2010

### 3 Summary of the coordination literature about beef agribusiness system: International and Brazilian perspectives

Beef agribusiness system has lower coordination than broiler and hog supply chains,

even in countries of higher productivity as the USA, Australia and New Zealand. The reasons why are partially due to bovines' biological characteristics, their bigger size and longer life cycle that require greater land and feeding inputs (Bailey et al, 1994); the breed and geographical diversities in beef raising that diminishes production uniformity (Wachenheim; Singley, 1999); and the lower use of vertical marketing devices such as integration and forward contracts by the pack industry (Hayenga *et al.*, 2003).

In respect to vertical contract integration Hayenga et al. (2003) identified three factors stimulating new contract and marketing agreements between cattle producers and the packer industry: reduced operational costs, enhanced risk management, and cattle and beef quality. Ward (2001) developed a methodology to assess beef agribusiness alliances based on four broad areas: common objectives, chain coordination, breed specification and formal commitments.

Additionally Kovanda and Schroeder (2003) described that beef alliances face performance and relational risks. Performance risk refers to partners' bilateral dependency that evolves through the alliance requirements that are not easy to assess, as feeding and breeding practices like hormone and antibiotics ministrations. On the other hand, there are relational risks among agents due to the possibility of unilateral opportunistic behavior from one of the sides to cause economic losses to its partners.

Hueth and Lawrence (2004) have shown that grid pricing mechanisms to marketing fed cattle to pack industries aim at directing farmers to the desired carcass patterns. The grid price scheme provides vertical coordination without requiring contracting or asset acquisitions by farmers or the packer industry.

The empirical investigations on comparative alliances provide some clues to its success. Boucher et al. (2005) presented three cases of calf marketing alliances, Vernom Beef Alliance, Beef Advantage Association, and Piedmont Cattle Marketing Association, and also three cases of fed steer marketing alliances, Gene Net Alliance, Caprock Cattle Feeders and B3R Country Meats, all of them sited at east and south USA. Boucher et al. (2005) concluded that strategic alliances provide feedback information about carcass characteristics to cattle producers and allows them to work on greater standardization of their animals and so forth to the slaughtered carcasses.

The Brazilian literature about the beef supply chain points to the lack of coordination among cattle producers, packer industry and retailers as a cause to the emergence of short-term strategies, based on price fluctuations and opportunistic behavior. The research tended to highlight, on the one hand, the beef agribusiness heterogeneity, in which there are informal



transactions, low degree of animal standardization, lack of sanitary and quality guarantees to consumers. But on the other hand, Brazil has a pack industry that is a major international player, has the leadership in world exports, and is the second biggest beef producer.

According to Favaret Filho and Paula (1997), due to farmers' great land assets, result of the Brazilian history, emerged a speculative culture based on land price gains and not on the increasing productivity of the livestock. Adding to that, the industry used to be the weakest link in the production chain, in which live side by side modern packers and several local and regional clandestine slaughter houses that supply meat to the domestic market.

Bliska et al. (1998) pointed out that in accordance to game theory, the problems that arise in Brazilian alliance projects are due to information asymmetries and to uncertainty about the price reward for meat quality, both tended to result in a low response by farmers to economic incentives provided by alliances. In the same direction, Vinholis (1999) described the strategic alliance formed by Gejota pack industry and the retailer chain Cândia, which used a grid pricing scheme to reward carcasses by above average market prices. However, during the late nineties financial problems have arisen at Gejota packer and the slaughter schedules were not well performed by cattle producers, finally both reasons took the alliance to a halt.

Machado Filho and Zylbersztajn (2000) have shown that the Brazilian beef agribusiness system is in reality formed by two sub-systems, a low technology system which works with short-term market transactions, low sanitary and productivity standards, and a high technology system that is growing and requires deeper governance structures, like vertical internalization arrangements and strategic alliances, specially to deliver high quality cuts to the national and international markets.

Brum and Jank (2001) have pointed out that supply requirements posed by retailer chains can provide adequate incentives and coordination to strengthen quality patterns by the pack industry and cattle producers, however, that can be done only by large retailer chains that operate at Brazilian bigger urban centers, and so forth its inductive power does not reach to the system as a whole.

Barcellos and Ferreira (2006) developed an analysis of the advantages and pitfalls of a not named Brazilian alliance in which research was performed on partners' stated perceptions: breed association, pack industry and retailer. The conclusions traced by the study pointed out to agents' similar perceptions about alliance's advantages arisen from higher value meat products, greater access to markets, and production stability. The major demanding efforts to the alliance's success are the agents' commitment and long-term production planning.

The literature as a whole indicates that the beef agribusiness system requires adequate governance structures to increase productivity in accordance to consumer demands. Uncertainty and opportunistic behavior pose a challenge to long-term and high frequency transactions and require arrangements to enable deeper bilateral dependence and increasing agents' commitment.

#### 4 Methodology

The analysis was based on a field research performed with cattle producers who live in Rondonópolis - MT. Interviews were done through a scientific protocol which intended to identify four dimensions: farm profile; livestock production; genetics and marketing. The specific variables to assess the dimensions studied are stated in the box below:

Box 1: Interview Protocol

1 Farm profile	Owner Name / Address / Farm Name Area (ha) Location
2 Livestock	Rural activities: breeding, feeding, genetics. Traecebility (SISBOV/ERAS) Nutrition: mineral nutrition, protein supplementation, fodder Pasture: fertilization, pasture recuperation Grazing-system: rotational, alternate, deferred, silage, extensive
3 Genetics	Bulls, insemination, artificial insemination in fixed time, fetal sexing, embryo transfer, breeding season
4 Marketing	Transactions: in cash and/or in installments (30 days), rural promissory notes (NPR), rural product note (CPR), forward contracts, futures contracts Production destination: domestic wholesale, domestic retail, European Union, other export destination

Source: Elaborated by the authors.

The sample of cattle producers was defined in accordance to Rondonopolis rural association and the interviews have been accomplished along the months of August to September 2010, through personal contacts and distance interviews (e-mails); in all situations a hard copy was maintained as a saving file. The scope of the interviews aimed to describe

beef cattle livestock activities and marketing transactions at delivering fed animals to slaughter. That strategy was the result of the research's purpose of understanding the coordination between cattle producers and packer industry.

The distribution is in accordance to the size of farms and follows the official criteria of minifundio, small, midsize, and large rural unities. However, as a result of the concentration of agricultural land in Mato Grosso large and midsize farms' share in the sample is greater than minifundio and small farms' participations.

Fifty and nine cattle producers agreed to participate in the research and their answers formed the dataset in which was accomplished the statistical description and modeling. The econometric modeling was performed using an *Ordered Logit Model* which is suitable when the dependent variable is dichotomous and has two or more qualitative response categories in an ordered manner (Kennedy, 1997).

The choice is the result of the dependent variable to be dichotomous and related to three groups of arrangements used by cattle producers in transactions with the packer industry. In accordance to the results of the research, it was found the following arrangements: in cash and/or in installments (30 days), rural promissory notes (NPR), rural product note (CPR), forward contracts, futures contracts. Arrangements have been pooled together in three ordered categories (L1), (L2) and (L3):

#### Box 2: Governance arrangements classification

Level 1	In cash and/or in installments (30 days)
Level 2	Level 1 + NPR's + CPR's
Level 3	Level 2 + Forward Contracts + Futures Contracts

Source: Elaborated by the authors.

In doing so, the endogenous variable is made of an ordered qualitative assessment which varies from 1, 2, and 3 for each sample. Level 1 regards to producers who sell animals only in cash or in thirty days of installment. Whereas level 2 is made of producers who answered to engage in transactions of Level 1 (in cash and in installments), but also deal with rural promissory notes (NPR) and rural product notes (CPR), that points to greater coordination with the industry, at least in financial terms. Last but not least, level 3 regards to producers who deal beyond Level 1 and Level 2, and are engaged with forward contracts and futures contracts. Hence, Level 3 refers to a higher degree of governance complexity in the survey, because it entails terms and conditions for quantities, quality, deadlines and patterns

to carcasses, and so forth, requires greater systemic coordination. Exogenous variables are continuous (e.g. property land area) or discrete (e.g. cattle feeding, land grazing system, and market destination). The estimation results are discussed in section that follows.

## 5 Modeling analysis

### 5.1. Descriptive Statistics.

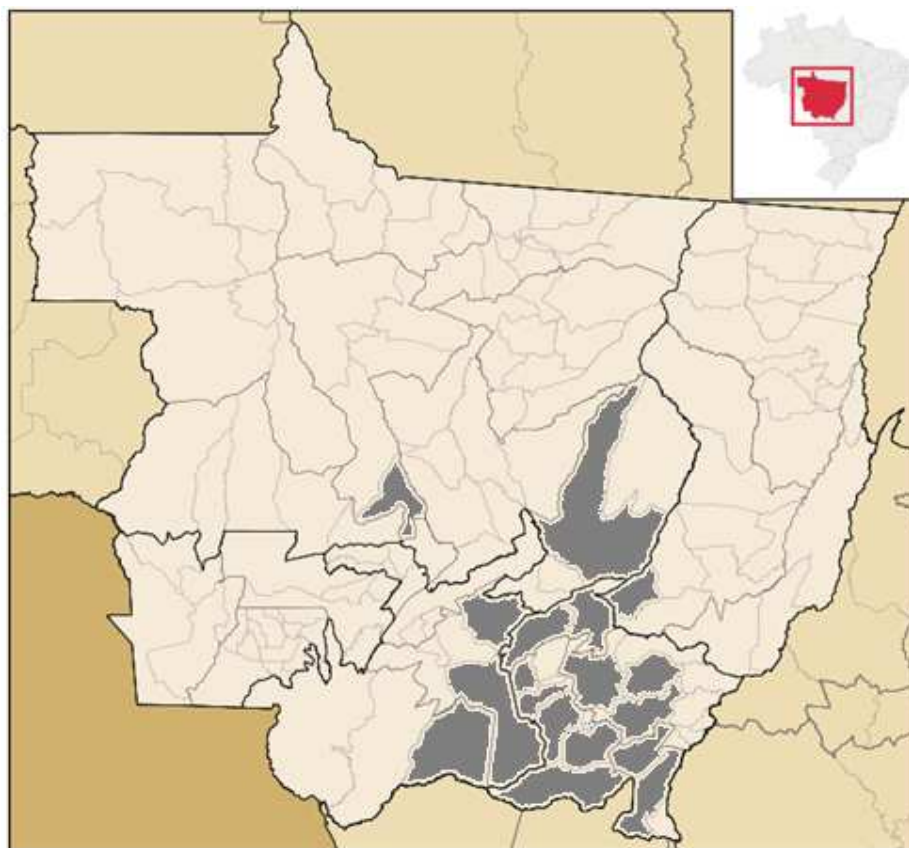
The sample is a set of interviews with fifty and nine cattle producers who live in Rondonópolis – MT and farms located in Mato Grosso. The choice for the size of the farms in hectares is in accordance to Mato Grosso's pattern of land distribution which highlights its concentration (Table 1).

Box 3: Location and quantity of the survey farms

County	Quant.	MT Region
Alto Araguaia	1	South-east
Alto Garças	1	South-east
Barão de Melgaço	1	Mid-South
Campo Verde	1	South-east
Chapada dos Guimarães	1	Mid-South
Guiratinga	2	South-east
Itiquira	8	South-east
Jaciara	1	South-east
Juscimeira	5	South-east
Novo São Joaquim	1	North-west
Paranatinga	3	North
Pedra Preta	4	South-east
Poxoréu	8	South-east
Primavera do Leste	2	South-east
Rondonópolis	12	South-east
Santo Antônio do Leverger	3	Mid-South
São José do Povo	1	South-east
São José do Rio Claro	1	North

Source: Elaborated by the authors

Figure 1: Geographical location of the counties of the farms



Source: Elaborated by the authors

Table 1: Classification in accordance to hectares (ha)

<b>Classification (ha)</b>	<b>Quant.</b>	<b>%</b>
0 < 100	3	5,1
100 < 200	7	11,9
200 < 500	7	11,9
500 < 1000	12	20,3
1000 < 2500	12	20,3
More than 2500	18	30,5

Fonte: Elaborated by the authors

All cattle producers answered to use Nelore cattle breed, however, fifteen (25%) also use other breeds, European or Asia. According to the production system, the same number of answers (15) pointed out to the use of feedlots to cattle finishing. All producers provide mineral salt supplements to animals on a daily basis, fifty four producers (92%) answered to

use some kind of nutrition supplementation, from those, thirty (51%) only in the dry season, fifteen (25%) during all year, six (10%) during finishing, and three did not answered.

Concerning to the management of grazing lands, the results pointed out that twenty and nine (49%) producers do some kind of soil fertilization. The usual practice is the application of lime to reduce soil's acidity in accordance to chemical analysis. Pasture recuperation is a routine to thirty and eight producers (64%), but its recurrence varies from a one to six years, the most usual response (16) was that it is done when "necessary".

The results about the application of a breeding program shows that thirty and eight (64%) cattle producers invest in natural breeding (bulls), twenty and one (36%) in breeding season, twenty and six (44%) in artificial insemination. On that last question, the options of choices are not excluding ones, in a way that each producer can answer more than one alternative, or even no one, when he is not engaged with breeding.

On the use of grazing lands, nine (15%) answered to use silage, twenty and tree, (39%) answered to do soil rotation, and fifteen (25%) are engaged in feedlot production. Concerning to marketing fed cattle it was found six arrangements: in cash and/or in installments (30 days), rural promissory notes (NPR), rural product note (CPR), forward contracts, futures contracts. It is important to stress that each cattle producer could pick more than one choice of answer, even all together, if in accordance to its marketing practice. Therefore, forty and eight (81%) cattle producers sell in cash and forty and six (78%) in thirty days of installment, thirteen (22%) are engaged with rural promissory notes (NPR). Only five (8%) sell their animals backed by a prior liability of a rural product note (CPR), while six (10%) deal with forward contracts. However, no cattle producer is engaged in a collective association to marketing animals, all of them answered to deal with the industry on an individual basis.

At last, it was asked about the final destination of the slaughtered animals, fifteen (25%) producers answered to follow the required standards to export markets, and two (3%) specifically the required by European Union. Most of producers do not know the final destiny of the beef produced, however they do have some general assessment of the carcasses' classification (age, sex, weigh, and fat layer) and therefore of the possible marketing outcomes.

In summary, the result highlights a favorable evolution in productive practices, like the supply of salt supplements (100%), nutritional supplementation (92%), and soil fertilization (62%). Genetics programs are increasingly been adopted by cattle producers, like breeding season (36%) or artificial insemination (44%). The Nelore genetic base of the cattle was

found in all interviews, but there is an increasing use of other Asiatic or European breeds (39%) in cross-breeding programs.

The research shows the gap that lies between the improvement in productive indicators in comparison to the marketing practices favorable to in cash transactions. Cattle producers' usual praxis is the negotiation on an individual basis, the frequency of the transactions is low, payments in cash or in thirty days of installment. The emission of rural promissory notes (NPR) is a device used by buyers (packers) in order to obtain short-term working capital. On the other hand, forward transactions have greater uncertainty because of packers' *default* risk in the last two years (2009 – 2010)<sup>2</sup>. In regard to that, Mato Grosso Federation of Agriculture (FAMATO) started a campaign to advise cattle producers to sell only in cash (IMEA, 2010).

Collective marketing arrangements had no answer, what points that in Mato Grosso beef producers are not keen to participate in associations and alliances in order to group together transactions with the industry. Taking as example of the national scenery collective marketing arrangements among cattle producers are more pervasive in Rio Grande do Sul (South region), Mato Grosso do Sul and Goiás (Mid-West region) usually by the use of grid-price schemes to assess the required standards based on carcass classification.

The main final destination of marketing fed cattle in Mato Grosso is to deliver whole carcasses ( hindquarter / forequarter / spare ribs) to wholesale markets in Brazil, on the other hand, deboned cuts are delivered to retailer chains in the country and to the external markets by the three major packers: JBS/Friboi, Brasil Foods/Sadia and Marfrig (FAMATO, 2007).

Forward contracting is a device increasingly used by feedlot operators who supply fed cattle during the dry season (May – September), however, in the last two years (2009 – 2010), higher feeding costs and lower volatility in cattle prices from dry to wet seasons reduced profits in feedlot operations (IMEA, 2010). As a result only six producers answered to be engaged with forward contracts to supply fed animals to industry, but the sample also shows that higher productivity is correlated to greater operational size. Namely producers who adopt more intensive techniques tend to operate in larger farms and cattle herds.

---

<sup>2</sup> In the last years (2009 – 2010) some of the major Brazilian packers halted operations in Mato Grosso and induced several defaults against suppliers: Independência, Arantes, Frialto e Quatro Marcos.

## 5.2 Econometric modelling.

The Ordered Logistic Model is an extension of the dichotonic logistic model applied to situations when it is necessary to rank the dependent variable in qualitative ordinal levels. The model is based on the cumulative  $C_{ij}$  probability of the ( $i$ ) individual in the ( $j$ )th or higher category.

$$C_{ij} = \Pr (y_i \leq j) = \sum_{k=1}^j \Pr (y_i = k) \quad (1)$$

The maximum likelihood method is used to estimate the cumulative probability of the logistic function:

$$\text{Logit}(C_{ij}) = \log (C_{ij} / (1 - C_{ij})) \quad (2)$$

The model has one constant term for each cumulative logistic function and the number of constants is equal to the number of ordinal categories minus one. The  $\beta$  parameters do not vary in accordance to the level of the constants and are indicators of how one-unit increase in the independent variable increases the log-odds of being higher than category ( $j$ ).

The empirical investigation was done by ranking cattle transactions in three ordered categories: N1 = in cash + installments, N2 = N1 + NPR + CPR, N3 = N2 + forward contracts + future contracts. It was calculated an ordered logistic model in which was tested several functional forms with the sample data. The results of the final regression are shown in the table 2 below.



Tabela 2: Ordered Logistic Regression

Variable	Parameter*	Z value
Land área	4,40 e-06 (0,0000181)	0,24
SISBOV/Eras (traceability)	-1,3131 (0,9896)	-1,33
Feedlot system	2,6425 (0,8040)	3,29
Exports	1,5744 (1,0477)	1,50
Cross breeding	0,5074 (0,8314)	0,61
Constant 1	2,2242	
Constant 2	4,1980	

(\*) In between brackets standard errors

LR Ch <sup>2</sup>	18,15
Prob> Ch <sup>2</sup>	0,0028
Pseudo R <sup>2</sup>	0,2382

The model is statistically significant at the 95% level and provides a predictive performance of 0,2382 in accordance to Macfadden Method <sup>3</sup>, the signs and the significance of the variables have interesting results. First the variable “feedlot” has no significance at the 95% level, so that production system has no statistical correlation to the choice of the marketing arrangements. All the others explanatory variables have significance at the 95% level.

The variable “land area” is related to the land properties’ dimensions in hectares and it has a positive coefficient, so the greater the size of the farm, the greater the probability to be used governance arrangements based on contracts (N2 and N3). That evidence seems to provide a link between the scale of production at the farm level and the coordination with industry, mainly by the enrolment to forward contracts to supply animals in the dry season.

The variable “SISBOV/Eras” is related to the adoption of the traceability program

$$^3 R^2 = 1 - \frac{\text{LnL}(M_{ful})}{\text{LnL}(M_{intercept})}$$

Mfull = model with predictors / Mintercept = model without predictors (NORUSIS, 2007).

required by European Union, its coefficient is significant as has a negative sign, so producers who have that certification tend not to use contracts to marketing cattle to packers. At the first sight this result was not the expected one, however after some contacts to producers they made clear that the ERAS certification provides price premiums obtained from case by case negotiations with packers. The competition in the industry to obtain animals which are in accordance to EU restrictions provides incentives to short-term price arbitrage and in cash transactions. However, producers also have mentioned that as the supply of traceable cattle increase there will be lesser room for price premiums and that may reward the use of forward contracts.

On the other hand, the variable “exports” relates to the final destiny of the slaughtered cattle. The positive sign of the parameter and its significance shows that producers who supply animals with the required classification to the external markets tend to use more coordinated arrangements (N2 and N3). That finding points that the increase in beef exports in Mato Grosso works in favor to higher systemic coordination among producers and packers.

Last but not the least, the variable “cross-breeding” has a positive parameter, so producers who apply more intensive livestock techniques tend to invest in cross-breeding programs between Zebu cows and European bulls or artificial insemination<sup>4</sup>.

## **6 Conclusion**

The paper aimed at relating cattle producers’ profiles in the beef supply chain to governance arrangements to marketing fed cattle in Mato Grosso’s south-east region. The sample is made of fifty and nine interviews with cattle producers who live in Rondonopolis – MT. The research found that the variables with significance to the use of coordinated governance arrangements (i.e. forward contracts) are related to the scale of the production land area, the orientation of the production to exports and breeding practices (cross-breeding).

The research also found that production practices like supply of mineral components, nutritional supplementation in the dry season, and genetic programs, in a higher degree, and grazing land reform and lime application to soils, in a lesser degree, have not statistical significance to increased coordination. That because those practices are already performed by the majority of the producers in now days.

---

<sup>4</sup> The more quoted breeds have been Nelore, Angus, Aberdeen and Guzerá.

In an interesting finding the “Sisbov/Erás” variable was found to have a negative sign, this because that certification enable producers to negotiate price premiums with packers. At last it is striking the gap between the favorable trend in the use of more intensive productive practices *vis-à-vis* the low response among producers and the pack industry to strength transactions coordination in marketing fed cattle.

## References

BONJOUR, M. S. C. de; FIGUEIREDO, A. M. R; MARTA, J. M. C. Pecuária de corte no Estado de Mato Grosso. In: XLVI CONGRESSO SOCIEDADE BRASILEIRA DE ECONOMIA, ADMINISTRAÇÃO E SOCIOLOGIA RURAL, 2008, Porto Velho. **Anais: SOBER**: São Paulo: SOBER, 2010. Disponível em: <<http://www.sober.org.br/palestra/9/519.pdf>>

BARCELLOS, M.D. de; FERREIRA, G.C. Vantagens e desvantagens das alianças estratégicas: uma análise sob a ótica dos agentes da cadeia produtiva da carne bovina. **Organizações Rurais & Agroindustriais**, Lavras, v. 8, n. 1, p. 117–130, 2006.

BLISKA, F.M. de M.; GUILHOTO, J.J.M.; PARRÉ, J.L. O programa de produção de carne qualificada de bovídeos de São Paulo sob o enfoque da teoria de jogos. **Informações Econômicas**, São Paulo, v. 28, n. 2, p. 27-36, fev. 1998.

BRUM, B.L.R.; JANK, M.S. A padronização na gestão da cadeia de suprimentos da carne bovina por supermercados. **Gestão & Produção**, São Paulo, v. 8, n. 1, p. 68-83, abr. 2001.

CALEMAN, S.M.Q.; GONZALES, F.G.; SPROESSER, R.L. The mercadological alliance between the sul-matogrossense alliance of steer producers with the Carrefour supermarket chain. In: INTERNATIONAL PENSA CONFERENCE, 3., 2003, São Paulo. **Anais...** São Paulo: USP, FEA, 2003. Disponível em: <<http://www.pensaconference.org/>>.

FAVARET FILHO, P.; PAULA, S.R.L. de. Cadeia de carne bovina: o novo ambiente competitivo. **BNDES Setorial**, Rio de Janeiro, n. 7, p. 1-18, set. 1997.

FAMATO – FEDERAÇÃO DA AGRICULTURA E PECUÁRIA DE MATO GROSSO. **Diagnóstico da cadeia produtiva agroindustrial da bovinocultura de corte do Estado de Mato Grosso**. Cuiabá, 2007. Disponível em: <[www.fabov.com.br/arquivos/fab0121081200939536.pdf](http://www.fabov.com.br/arquivos/fab0121081200939536.pdf)>

HAMER, E.; ZUGE, M.; SILVA, M. T. da. Análise dos fatores condicionantes da reestruturação agrícola no Estado de Mato Grosso In: XLIV CONGRESSO SOCIEDADE BRASILEIRA DE ECONOMIA, ADMINISTRAÇÃO E SOCIOLOGIA RURAL, 2006, Fortaleza **Anais: SOBER**: São Paulo: SOBER, 2010. Disponível em: <http://www.sober.org.br/palestra/5/996.pdf>

IBGE – INSTITUTO BRASILEIRO DE ESTATÍSTICA E GEOGRAFIA. **Banco de dados agregados da pecuária**, 2010. Disponível em:

<http://www.sidra.ibge.gov.br/bda/pecua/default.asp?z=t&o=23&i=P>

IMEA – INSTITUTO MATO-GROSSENSE DE ECONOMIA AGROPECUÁRIA. **Boletim Semanal de bovinocultura**, 2010 (diversos). Disponível em:

<http://www.imea.com.br/publicacoes.php?categoria=2&subcategoria=2>

KENNEDY, P. **A guide to econometrics**. Oxford: Blackwell Publishers, 1995

MACHADO FILHO, C.A.P.; ZYLBERSZTAJN, D. **Competitiveness of meat agribusiness chain in Brazil and extensions for Latin America**. São Paulo: USP, FEA, set. 2000, p. 1–30. Disponível em: <http://www.ead.fea.usp.br/wpapers/index.htm>.

NORUSIS, M. J. **PASW Statistics 18 Guide to Data Analysis**. Pearson, 2007.

PEROSA, J.M.Y. Papel da coordenação em alianças de mercado: a experiência do sistema agro-industrial da carne bovina, In: WORKSHOP BRASILEIRO DE GESTÃO DE SISTEMAS AGROALIMENTARES, 2., 1999, Ribeirão Preto. **Anais...** Ribeirão Preto: USP, FEARP, 1999. p. 69–80.

PIGATTO, G.; SILVA, A.L. da; SOUZA FILHO, H.M. de. Alianças mercadológicas: a busca da coordenação da cadeia de gado de corte brasileira. In: WORKSHOP BRASILEIRO DE GESTÃO DE SISTEMAS AGROALIMENTARES, 2., 1999, Ribeirão Preto. **Anais...** Ribeirão Preto: USP, FEARP, 1999. p. 200–209.

VINHOLIS, M. de M. B. Uma análise da aliança mercadológica da carne bovina baseada nos conceitos da economia dos custos de transação, In: WORKSHOP BRASILEIRO DE GESTÃO DE SISTEMAS AGROALIMENTARES, 2., 1999, Ribeirão Preto. **Anais...** Ribeirão Preto: USP, FEARP, 1999. p. 189-199.

ZEN, S. de. Produtor e frigorífico: a simbiose necessária. **Agroanalysis**, Rio de Janeiro, v. 25, n. 6, p. 35-36, 2005.