Beef cattle productivity index: an application in the Beef TAC

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Key messages

✓ The transfer of cattle from one property to another is one of the ways in which cattle producers with socio-environmental irregularities manage to sell cattle to farms with no irregularities and evade commitment controls.

✓ One way to monitor and suppress the laundering of cattle is to calculate the maximum productivity index of a beef cattle ranch.

✓ The audits of the commitment of the Term of Adjustment of Conduct (TAC) for Beef will be key to proving the effectiveness of the index application and any possible needs of method calibration.

The basic concept of productivity in the economy is the relationship between the end product and the means employed in its production. Traditionally, the most used relationship in agriculture and cattle raising is a simple and direct ratio between the amount produced of the commodity and the area, a factor of greater value, used for its production in a given time interval. In beef cattle-breeding activities, this ratio can be expressed in several different ways but the most usual is arrobas [a trade unit of 14.69 kg of beef] produced per hectare in a year.

This concept is simple to calculate when the property information is efficiently managed. However, this is not the reality of most beef cattle farms in Brazil. The activity of finishing or fattening animals on pasture is generally a multi-annual activity, i.e. animals bought in a certain year will only be sold the following year. Therefore, the producers many times have difficulties in accounting for the farm's inventory of arrobas over time, either because they are unaware of management concepts or simply because they do not have the scale to do so.

Researchers from the University of São Paulo's Luiz de Queiroz Foundation for Agricultural Studies (Fealq/USP), USP's Centre for Advanced Studies in Applied Economics (Cepea/USP) and the Institute for Forest and Agricultural Management and Certification (Imaflora) conducted an analysis to help with the establishment of a livestock productivity index that could inform the monitoring system of cattle suppliers in terms of cattle laundering.

Cattle laundering allows producers with a noncompliance to sell their cattle as if they are within the law. When selling a lot to the slaughterhouse, the producer has to present the Animal Transit Guide (GTA), which shows the name of the farm that sourced the cattle. Since the farmer knows that the processing plant cannot accept animals from embargoed areas, the farmer uses the GTA of another farm that is "clean" with the environmental agencies.
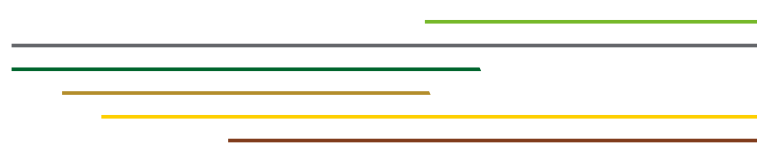
Method

This analysis sets out to measure the productivity of a beef cattle ranch using the ratio of the number of animals destined for slaughter per unit of area within a one-year period. It should be noted that this relationship is a little broader and less precise when one tries to analyse the efficiency of the system in producing arrobas. However, it is also a ratio between product (livestock) and production factor (area) and a direct consequence of the productive efficiency of the system. The researchers, therefore, proposed to delimit the productivity range so it can be used as a parameter of analysis.

The study simulated three situations in order to establish a minimum, average and maximum interval that shows the number of heads sold for slaughter per hectare, given a certain stocking rate of a hectare of pasture.

The amount of finished cattle, in heads, that would be ready for slaughter given a certain stocking rate was estimated based on the stocking rate of the average weights of slaughtered animals included in the Quarterly Slaughter Survey of the Brazilian Institute of Geography and Statistics (IBGE, 2019) and the offtake rates of the modal farms.

Results

The researchers came up with the following three indexes:

Minimum productivity index

The minimum productivity of the systems was calculated considering the current stocking rate of pasture areas for municipalities in the Legal Amazon. To calculate the base stocking rate, we used data from the Agricultural Census of the Brazilian Geography and Statistics Institute (IBGE, 2017) for pasture areas per municipality expressed in hectares, as well as for the herd, taken from the Municipal Livestock Survey (IBGE, 2018).

The number of animals expressed in heads in the Agricultural Census was converted to animal unit (AU). The conversion of the number of heads of the herd to AU was done by taking into account the estimates of the Centre for Advanced Studies in Applied Economics (Cepea) for the structure of herds and their respective categories and weights. Thus, to calculate the stocking rate, the amount of AU was divided by the total area of pasture, obtaining an average stocking rate for the region of 0.73 AU/ha.

Average productivity index

To estimate the average number of animals for slaughter, we used the state average stocking rate in AU/ha. The data was obtained from Cepea's base for modal properties in the main producing regions of the Legal Amazon. For the state of Acre, the average stocking rate was 0.96 AU/ha, for Mato Grosso, 1.10 AU/ha, Pará, 0.93 AU/ha, Rondônia, 1.12 AU/ha, and Tocantins, 1.04 AU/ha.

Maximum productivity index

To base the maximum productivity parameter on pasture, the potential stocking rate of 2.5 AU/ha, defined by Andrade (2005) for pasture-raised beef cattle in the Amazon region, was used in the calculations. The top or upper limit of the range of animals ready for slaughter was defined by applying this stocking rate to the production estimates of the systems. The use of this stocking rate simulates the reality of a property that manages its forage plants well and achieves better herd performance.

Application of the Productivity Index for monitoring the Beef TAC

One way to check if cattle is being laundered is to check productivity. The Cattle Supplier Monitoring Protocol is using this analysis. The company should calculate the maximum productivity index of the supplier farm. The Protocol establishes that, in order to inhibit and reduce the possibility of animals sourced from areas with noncompliances from being transferred to others that are in conformity with the requirements of the TACs ("animal triangulation") and their subsequent sale to slaughterhouses, a theoretical productivity index of cattle per hectare per year must be adopted that can show suspected cases of "animal triangulation".

This theoretical productivity index should be calculated by the ratio between the number of animals sold to the slaughterhouse and the

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Imaflora is a Brazilian non-governmental organization created in 1995 to promote the conservation and sustainable use of natural resources by generating social benefits in the forestry and agricultural sector.

alternative use area (consolidated use) of the property in a tax year, based on information from the Rural Environmental Registry (CAR), expressed in heads/ hectare/year (heads/ ha/year).

The maximum acceptable value for the theoretical productivity index is 3 heads/ha/year, using the tax year as the time period. For properties that present a theoretical productivity index above 3 heads/ha/year, the production system in force on the property must be verified, such as confinement, semi-confinement, feed supplementation, etc., in order to justify the productivity index reached. The Protocol suggests that for these cases, the evidence should be kept for verification purposes or future audits.

Next steps

The Livestock Supplier Monitoring Protocol was implemented by slaughterhouses throughout 2020. The effectiveness of applying the maximum productivity index calculation to supress cattle laundering should be checked through verification audits over the next two years.

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