



▣ Accuracy and precision of the Brazilian livestock data (Census x Estimation): Bovine, Poultry and Pork

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Brazil is a leading player in the beef, poultry and pork world markets, ranking as the world's largest meat exporter. It is the largest exporter of beef (home to the world's biggest commercial cattle) and poultry (being the 3rd world's producer), as well as the 4th largest producer and exporter of pork. The Brazilian Institute of Geography and Statistics (IBGE), responsible for the statistical information, performs two surveys for livestock: a) the Municipal Livestock Research (called PPM), by estimation, and b) the Livestock Census. In order to assess the reliability of the surveys throughout the Census years (1975, 1980, 1985, 1995 and 2006), data about bovine (heads), poultry (x 1,000 heads) and pork (heads) were collected by states from Census and PPM database. For the evaluation, accuracy and precision of the surveys were tested. Regarding bovine cattle, it can be stated that accuracy and precision, respectively, have lowered over the years, what can be explained by the increase in the herd size (2006 Census was the least accurate). The estimations overestimated the values, as most biases were positive and also the states with larger cattle sizes were more susceptible to errors, i.e. their biases were positively greater. Concerning poultry, the 1975 and 1980 Censuses were not accurate. Over the years, there was reduction in the estimates precision compared to the Census, especially for 1995 and 2006. The states with larger chicken populations were more susceptible to errors, i.e. their biases were positively greater (1975, 1980 and 1985) and tended to be (1995), or were negatively greater (2006), meaning that estimations were higher or lower than Census data, respectively. Regarding pork, it is possible to state that the pig population declined throughout the years (for both censused and estimated values), unlike bovine and poultry. The 1975, 1980 and 1995 Censuses were not accurate, despite the strong indicative of increasing mean bias in the latest years. The residual errors rose over the years, even without growth of pig population. There is indication that the loss in accuracy and precision over the years was no longer dependent on the pig population of the states. So, caution should be paid for states with larger bovine herds and chicken populations, due to the lower ability of the estimation to be consistent with the censused values. Either the estimation may be overestimating or the Census may be underestimating the values, even by under-declaration by the ranchers.

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