

Typology of Cattle Production in Brazil at the Municipality Level

M.D.C.R. Fasiaben^a, L.G. Barioni^a, A.G. Maia^b, M.M.T.B.A. Almeida^c and O.C. Oliveira^c

^aEmbrapa Agriculture Informatics, Av. André Tosello, 209, Barão G., 13083-886 Campinas - Sp, Brazil;

^bIE/UNICAMP, Rua Pitágoras, 353, 13083-857 Campinas, Brazil; ^cIBGE, AV. BEIRA MAR, 436 -13° ANDAR, 20021-060 Rio De Janeiro, Brazil
barionilg@gmail.com

Brazil is one of largest beef producers in the world. Data from the Brazilian Agricultural Census 2006, carried out by the Brazilian Institute of Geography and Statistics (IBGE), has shown that approximately 2.7 million farms had bovine cattle, *i.e.* more than half of the farms in the country, raising 176.1 million head. In the last three decades, the expansion of beef production has relied strongly on increasing stocking rates and animal productivity rather than expansion of pasture area. Still, there is high variability in productivity levels and technology adoption throughout the territory. Identifying and characterizing such variations is essential to allow improving the estimates of greenhouse gases flows, and to better evaluate mitigation and adaptation options besides other issues related to technology adoption and public policies.

A typology of the Brazilian municipalities (totalling 5.517 municipalities) was carried out through factorial and cluster multivariate statistical analysis on data of the last available Agricultural Census (2006). Data was filtered for farms with bovines and regrouped by municipality. Forty-seven variables, either as originally collected or calculated from primary data were selected. Those variables encompass socioeconomic and technological information aggregated at municipality level, such as land use, herd size, pasture area (natural and planted), production activity, productivity, stocking rate, pasture management, input usage, source of producer's income, percentage of the income that comes from cattle, family or conventional farming, among the most important.

The analysis identified 10 different groups of bovine cattle production municipalities. Results were validated with cattle production expert researchers and were considered consistent with the Brazilian reality. Spatial patterns of concentration of some municipality aggregate types of production systems were evidenced. For instance, the concentration of low technology and productivity cattle production in the semi-arid Northeast and the trend for extensive production in large farms in the Brazilian center-east. However, several types of cattle-producing municipality types coexist in several regions. For instance, the state of Minas Gerais has both municipalities with technologically advanced beef cattle production systems and low productivity dairy production.

Based on the experience of this municipality-level study, a new typology project has been initiated to classify cattle production systems at farm level (around 3 million records) applying the same techniques but selecting mainly technology and productivity related variables, aiming at providing more detailed information for modeling production systems and future scenarios construction for the Brazilian beef and dairy industries.