GENETIC AND ENVIRONMENTAL EFFECTS ON CHARACTERISTICS OF LACTATION CURVES OF HOLSTEIN COWS REARED IN FREE STALL

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The objective of this study was to evaluate genetic and environmental effects on the form of lactation curves (Quadratic, Gama, Linear Hyperbolic ands Jenkins & Ferrel) in Holstein cows reared in a free stall system. In total, 920 lactations of 277 cows in the Sector of Milk Production (SMP) of EMBRAPA Cerrados, localized in the Federal District from 1985 to 1996. The parameters of the lactation curves (production at start of lactation a, mean increment rate - b and mean decline rate after peak c) were estimated using the "Table Curve" program (Jandel Scientific). These parameters as well as production traits (mean daily milk yield, total lactation yield, lactation length and last milk control) were analyzed using the correlation and general linear model procedures of SAS. The statistical model included lactation number, as well ads month and year of start of lactation. Heritabilities, permanent environment, genetic and phenotypic correlations were estimated using MTDFREML. Lactation number influenced ($P<0,01$) parameters a as well as the coefficient of determination. This was also influenced by year of lactation. Production traits were also influenced by these factors as well as year of lactation. Lactation length was only influenced by month of start of lactation. Genetic correlations between curve parameters and production traits were in general negative. Heritabilities for curve parameters were low while production traits were close to literature estimates. The quadratic curve best fitted the data, but low heritabilites show that these parameters should not be used in selection programs.

SUSTAINABILITY AND DAIRY CATTLE PRODUCTION IN THE HIGHLANDS OF CENTRAL MEXICO

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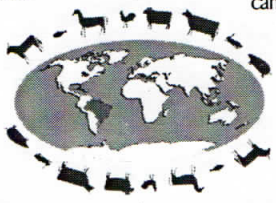
Considerable attention has been given to sustainability evalution through systemic approaches involving environmental, economic and social indicators. In this study, indicators were developed and measured through a three-year period at the farm and community levels in the Valley of Toluca, Mexico (2600 masl, subhumid temperate), where small-scale, diversified campesino systems predominate. Two contrasting systems involving dairy cattle were selected as case studies, one including maize and cattle and another one with horticulture and semi-urban dairying. In the first case, increased specialisation towards grass and silage use has resulted in higher milk yields and better margins, but with a higher external-input use. Highly resource-efficient farms were also identified. Others overuse family labour as a strategy, whereas less efficient farms depend more on non-agricultural income. Community organisation has been found to indirectly impact productivity and economic stability. Currently, efficient fertiliser use and forage conservation practices are being evaluated within farms, in order to estimate their contribution to farm sustainability. In the second case study, high productivity of horticulture and sucessful marketing contrast with a high agrochemical use, whilst dairying benefits from the byproducts of horticulture and local milk consumption. Organic horticultural production is now being succesfully tested as an alternative. Indicators have proved to be a valuable decision-making tool, with increasing consensus on methodologies for their definition and evaluation at farm level. Even though sustainability of studied systems can be greatly improved, it is neccesary to integrate these studies with regional and macroeconomic evaluations, which could contribute to design more favourable policies.



EFFECT OF TEMPORARY WEANING AND/OR ESTRADIOL BENZOATE AFTER REMOVAL OF AN INTRAVAGINAL SPONGE CONTAINING PROGESTAGEN ON LUTEAL FUNCTION AND ESTRUS IN SUCKLED ANESTRUS COWS (PRELIMINAR RESULTS).

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The aim in this study were to compare 3 estrus synchronization treatments on the formation of corporea lutea (FCL) and estrus signs in suckled beef cows (n= 275) during 2 years. Treatments consisted of an intravaginal sponge containing progestagen for 7 days combined with: 1) an inyection of 0.5 mg estradiol benzoate (E.B.) 24 hours after device removal (DR) (T I), 2) temporary weaning (TW) for 5 days after DR (T II) and 3) an inyection of 0.5 mg E.B. 24 hours after DR as well as TW for 5 days after DR (T III). T III was superior ($P< 0.01$) in porcentage of estrus to T I and T II in cows treated in Spring (Period I) as well as the cows treated in Summer (Period II). FCLs was similar in T I and T III, and superior to T II (60.6; 80.3 and 43.5 respectively; $P= 0.01$). Cows that calved in Period II showed a higher percentage of FCLs than those that calved in Period I (84.7% vs 35%; $P= 0.0001$). The interval from sponge withdrawal to onset of estrus (hs) was affected by parity (50.1 and 57.4, primiparous and multiparous, respectively, $P=0.004$) and by Period (68.1 vs 39.3, Period I and II respectively, $P= 0.0001$) but not by treatments ($P=0.15$). Best percentage of estrus was obtained with T III and similar results in FCL as with T I and no differences in the interval from sponge withdrawal to onset of estrus between the treatments.

COMPETITION OR COMPLEMENTARITY BETWEEN CATTLE AND CROPS ON SMALLHOLDINGS IN NORTH-EASTERN PARÁ, BRAZIL

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An efficient resource use is crucial for farms with low external input. Running various activities increases the opportunities for integration. Since about 30 years, a growing number of smallholders in north-eastern Pará has added cattle production to their existing slash-and-burn agriculture. This study was aimed at assessing whether the introduction of cattle enabled the farmers to use their own resources more efficiently. Thirty-seven smallholdings with cattle had been visited monthly in order to draw a complete overview of the resource use of one year. Crops and herd management did not compete for the production factor labour as beef cattle were held in an extensive manner. The related pasture establishment was however competing as it coincided with slashing and burning for subsequent planting of crops, whereas pasture maintenance could be done complementarily. As the major portion of pastures was planted on cultivatable land, an increase in pasture size competed directly with cropping activities. The demand for capital was relatively low on farms with cattle and cassava flour production and became only important, when new processing facilities were needed. Capital was crucial when the farmer also cultivated (semi-) perennial crops. In these cases, the indirect internal use of products played an important role, as one commodity was sold to purchase inputs for another one. Contrarily, the direct internal use of products played a minor role as feeding cattle with by-products and fertilizing fields with manure was not very common. Interrelationships between cattle and crops were thus widely limited to mutual financial support.