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Milk production and calf rearing practices in the smallholder areas in the Eastern Cape Province of South Africa

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Farmer perceptions on milk production and calf rearing practices on communal rangelands in the smallholder areas of the Eastern Cape Province, South Africa were evaluated on a total of 218 cattle farmers using structured questionnaires, semi-structured interviews with key informants and personal observations. Nearly 70% of the households in the small-scale areas milked twice a day compared to 60% in the communal areas. About 62% of the interviewees weaned calves between 6 and 12 months of age. Milk yield/cow/day (7.5 +/- 0.5 litres), fresh milk consumption/household/day (3.2 +/- 0.5 litres) and sales/household/day (3.1 +/- 1.1 litres) were highest in the sour-veld, small-scale farms ($P < 0.05$). Sour milk consumption/household/day (2.6 +/- 0.2 litres) and sales/household/day (0.8 +/- 0.2 litres) were significantly high in communal farms with a sour-veld. It was concluded that, calf rearing practices were poor and milk yield, consumption and sales were generally low and varied with production system and rangeland type. Further research is required to improve calf management practices, cow nutrition, milk yield and quality and how milk production can be used as a toll for rural development in the smallholder areas of South Africa.

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Comparative labs-on-a-chip for dairy product analysis with automatic calibration using spectrophotometric or colorimetric temperature and tuple chemometric analyte systematization

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This paper is a comprehensive review of current state in lab-on-a-chip techniques for dairy product analysis including some unpublished results of our research group, which differ both in the calibration and registration principles from their foreign counterparts. The fundamental difference of those devices is the possibility of calibration using spectrophotometric or colorimetric temperature and the tuple analyte systematization in intelligent databases. The functional characteristics of our devices at the time of development were not inferior or even superior to all the known analogs. Labs-on-a-chip with a comparative analysis scheme where the main analyte parameters in a reference lab-on-a-chip were compared with those in a test lab-on-a-chip were designed in order to replace the functions of complex two-beam spectral instruments. Later a number of the above device modifications have been developed implementing or replacing the functions of colorimetry, nephelometry/turbidimetry, coagulometry and pioscopic detection of coacervating lipid inclusions. The use of specialized adapted spectroscopic software and the advanced spectral-mathematical models in the output data interpretation allows to increase the heuristic value of the control process, which can be of great interest for veterinary inspection and the feeding quality control based on chemometric milk parameters in dairy zootechnology.

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