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Designing a multicriteria index at farm-scale to assess dairy farm abandonment risk in mountain area

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Grass-based dairy farming systems located in mountains provide multiple services to these territories by preserving landscapes, biodiversity... However, the number of dairy farms decreases since the 1980's. This abandonment is mainly due to a lack of intergenerational transmission (IT) explained by farm features (structure constraints, economic assets) and on-farm working conditions (FWC) which are considered as major critical issues of sustainability. So, assessing those aspects can lead to detect possible leeway to improve sustainability of dairy farms and to maintain milk production in mountains. Yet, among the many existing sustainability indexes at farm-scale, few integrate social and economic aspects including FWC and IT. Those indexes do not allow getting a precise overview of working conditions and transmission possibilities by being too restrictive or too subjective. So the aim of this study is to design a multicriteria index focused on those aspects. To design a relevant and meaningful tool to the target users – the farmers – a bottom-up approach has been chosen. First, a focus-group, including farmers, advisors and researchers, defined criteria covering the different aspects of FWC, IT. Then, they selected or created appropriate indicators out of a list of possible existing indicators. Afterwards, the index has been built by weighting indicators and criteria. This process results in an index made up with: (1) 5 criteria for working condition described by 40 indicators including original criteria such as mental dimension of work; (2) 6 criteria for farm transmission described by 21 indicators covering structure and production features, economic assets and transmission perspectives. The index will be further tested on dairy farms.

Session 42

Theatre 3

Environmental and economic consequences of feeding increased amounts of solid feed to veal calves

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Veal calves, traditionally, receive the majority of their nutrients from milk replacer (MR). Nowadays, however, increasing amounts of solid feed (i.e. concentrates and roughages) are fed, partly because it is enforced by legislation, partly because of increasing prices of MR. To determine the potential and the effects of substitution of MR by solid feed, an experiment was set up with 160 calves, aiming at equal carcass gain on eight different diets. Two different solid feed mixtures were fed at four predefined levels, ranging from 20 to 250 kg dry matter. Mixture-1 (M1) contained 80% concentrates, 10% maize silage and 10% straw on dry matter basis, whereas mixture-2 (M2) contained 50% concentrates, 25% maize silage and 25% straw. Additionally, MR was fed to achieve equal rates of carcass gain on all diets. The reduction in MR provision required to achieve equal rates of carcass gain at increasing levels of solid feed was 0.70 kg MR/kg solid feed for M1 and 0.62 kg/kg for M2. Costs of the solid feed needed to substitute one kg MR are 53-55% lower for both mixtures, whereas global warming potential was 40% higher for M1 and 34% higher for M2. The higher global warming potential mainly resulted from an increase in methane emission from rumen fermentation. Lower energy use, due to less water to be heated, and lower emissions from feed production (for M2) could not compensate for this. Other environmental impacts, for example acidification and land use, however, still need to be considered. From this study we conclude that replacing part of the MR in diets of veal calves with solid feed is economically sound, when only feeding costs are considered, but results in increased global warming potential, mainly due to increased methane emissions.