



## Suitability of different dairy cow types for an Alpine organic and low-input milk production system



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### ABSTRACT

The implementation of a seasonal, site adapted, pasture-based milk production system as applied in New Zealand and North Western Europe might be an alternative for the near future in Alpine regions. As in such a low-input system the fertility and secondary traits such as robustness against metabolic challenges of dairy cows is of crucial importance, it is questionable whether conventional dairy cow types, which were selected primarily for milk production under high-input conditions, are most suitable. Therefore the aim of this study was to compare two different genotypes concerning their suitability for an organic, low-input milk production system under Alpine conditions. Between 2008 and 2011 records from 91 lactations of Brown Swiss (BS) and a special strain of Holstein Friesian (HFL) were collected at an experimental organic dairy farm. The BS cows represented the average Austrian BS population and were primarily selected for high milk yield. HFL cows were for decades selected under low-input conditions and were primarily bred for lifetime performance and fitness. The dataset was analysed using multi-factorial statistical models. BS was superior for most milk production parameters, but not for milk yield per unit of metabolic body weight. HFL had a lower body weight throughout the lactation, but mobilised significantly less body reserves, indicating a shorter and less negative energy balance. Both breeds had similar total feed and energy intake, but HFL had a significantly higher feed intake per unit of metabolic body weight. Furthermore, HFL conceived earlier and had a significantly shorter calving interval and an overall superior reproductive performance. Due to this, HFL has some advantages over conventional BS if managed in a pasture based, low-input milk production system, especially when block calving is involved.

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### 1. Introduction

Due to climatic and terrain conditions, permanent grassland is the principal form of agricultural land use

in large parts of the Alps. The conversion of forage into milk and meat by ruminants has a long tradition and dairy farming is the predominant production system. However, Alpine dairy farming changed substantially during the last 50 years from traditional, small scale, forage based dairy-farming with mostly dual purpose cattle breeds towards larger and more specialised, non-seasonal dairy systems with severely reduced pasture utilization and a strong increase of concentrate supplementation levels (Knaus, 2009; Marini et al., 2011). To reduce costs of production and to meet consumers' expectations, the implementation of a

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