

Finding the right cow for an Alpine organic low-input dairy system



Marco Horn¹, Andreas Steinwider², Johann Gasteiner², Leopold Podstatzky² and Werner Zollitsch¹

¹ University of Natural Resources and Life Sciences, Vienna, Austria, marco.horn@boku.ac.at

² Agricultural Research and Education Centre Raumberg-Gumpenstein, Irnding, Austria

Aim

Comparing productivity, body weight and reproductive performance of different cow types and thereby breeding objectives concerning to assess their suitability for an Alpine pasture-based dairy production system.

Conclusions

- BS produced more milk and milk solids than HFL, but this was paralleled by a higher and longer lasting mobilisation of body tissues.
- The less negative energy balance together with the higher genetic merit for fertility resulted in the superior reproductive performance of HFL.
- The superior reproductive performance HFL may be seen as a particular strength in a seasonal low-input, pasture-based dairy system.

Background

Pasture-based milk production systems might be an alternative for Alpine dairy farming in the near future. As the cows' fertility is of crucial importance in such low input systems, it is questionable whether conventional genotypes, selected primarily for milk yield under high input conditions, are most suitable.



Results

	Genotype		S _e ^c	P value
	BS ^a	HFL ^b		
Length of lactation, d	326	297	40	0.016
ECM ^d yield, kg	6,402	5,354	623	<.001
Fat content, %	4.06	3.91	0.14	0.095
Protein content, %	3.33	3.11	0.08	<.001
Somatic cell count, n	127,190	127,570	23,541	0.743
ECM ^d yield/BW ^{0.75 e} , kg	0.17	0.17	0.01	0.747
BW ^f , kg	600	539	16	<.001
Week of BW nadir	24	19	7	0.012
BW-loss ^g , %	12	10	4	0.037
Feed intake/BW ^{0.75} , kg	0.14	0.16	0.01	0.001
Calving to conception, d	103	73	40	0.016
Calving interval, d	395	353	43	0.002

^aBrown Swiss; ^bHolstein Friesian lifetime performance; ^cresidual standard deviation; ^denergy-corrected milk; ^emetabolic body weight; ^fbody weight; ^gbody weight loss from calving to nadir

Animals, material and methods

- Genotypes
 - High input: Conventional Brown Swiss (BS), selected primarily for high milk yield
 - Low input: Strain of Holstein Friesian (HFL), selected primarily for lifetime performance and fitness
- n = 91 lactations (BS=42; HFL=49), 4 years
- Mixed model (SAS 9.2) including cow within genotype as a random effect.

- BS was superior in most studied parameters of milk production and milk composition, but not in milk production per LW^{0.75}.
- BS went through a longer and more pronounced negative energy balance than HFL.
- HFL had a significantly higher total feed intake per LW^{0.75} from lactation week 1-18.
- HFL was superior for most parameters of reproductive performance studied herein.



The authors gratefully acknowledge funding from the European Community financial participation under the Seventh Framework Programme FP7-KBBE.2010.1.2-02, for the Collaborative Project SOLID (Sustainable Organic Low-Input Dairying; grant agreement no. 266367).