

# Utilisation of whey by beef cattle in alpine cheese production regions

I. Morel<sup>1</sup>, M. Meisser<sup>2</sup> and P.-A. Dufey<sup>1</sup>, Agroscope, Institute for Livestock Sciences ILS

<sup>1</sup>Tioleyre 4, 1725 Posieux, Switzerland, <sup>2</sup>Route de Duillier 50, CH-1260 Nyon, Switzerland  
isabelle.morel@agroscope.admin.ch - www.agroscope.ch

## Introduction

In alpine cheese-production areas, whey represents an important dietary energy source which is nevertheless little used, in addition to being perceived as an environmental problem. Consumption of whey by beef cattle might represent a profitable solution to this problem.



## Materials and methods

- 48 animals, 17.5 months old, 479 kg BW
- 4 genetic groups: Angus (AN), Limousin (LM), AN x LM, LM x Red Holstein
- 2 sexes: castrated males and females
- 3 experimental treatments (2 animals per genetic group and per sex in each treatment)
  - Group G:** grazing only; **Group B:** grazing plus 2 kg of rolled barley pellets per animal per day; **Group W:** grazing plus 20 l warm full-fat whey (6.68% dry matter [DM]) per animal per day
- Experimental period lasting 95 days, Swiss Jura, 1200 m a.s.l., summering farm
- Rotational grazing system with four paddocks per group, same available area and stocking density (5.6 ha and 1.8 LU<sup>1</sup>/ha)
- Height of the sward measured with herbometer before and after each use of a paddock
- Grass intake estimated on basis of difference in height measured at the beginning and at the end of each grazing period
- Whey intake measured each day per group and individually three times during the experimental period by *ad libitum* bucket distribution in the stable

### 3 treatments



G: grazing only



B: grazing plus barley

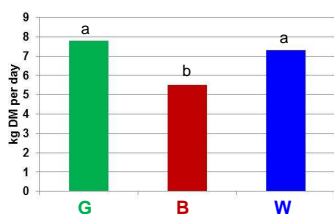


W: grazing plus whey

<sup>1</sup> LU = Livestock Unit

## Results and discussion

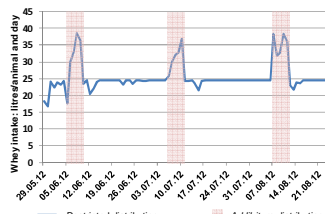
### Grass intake



Substitution effect by intake of barley  
Similar effect not observed for whey

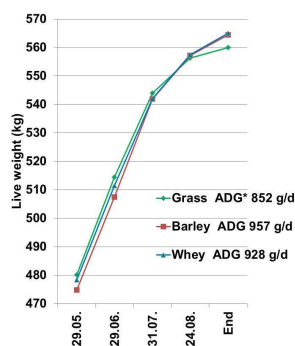
a, b: P<0.05

### Whey intake



3 animals of 16 refused to drink whey.  
Average intake:  
• restricted distribution: 24.6 l/d  
• *ad libitum* feeding: 32.8 l/d  
• over entire period: 25.5 l or 1.7 kg DM per day = 19% of total DM intake

### Growth performance



ADG\* with respect to control group G:  
B + 12% and W + 9% (ns)  
Effect of both genetic group (P=0.001) and sex (P=0.039) significant

\* ADG = Average daily gain

### Carcass quality

| Trait                           | Treatment         |                   |                   |
|---------------------------------|-------------------|-------------------|-------------------|
|                                 | G                 | B                 | W                 |
| Hot carcass weight              | 307               | 313               | 324               |
| Carcass yield                   | 54.7 <sup>b</sup> | 55.5 <sup>b</sup> | 57.4 <sup>a</sup> |
| Conformation:                   |                   |                   |                   |
| Diff. score initial-final       | 0.70              | 0.88              | 0.75              |
| Score at slaughter <sup>1</sup> | 4.22              | 4.31              | 4.42              |
| Level of fattening:             |                   |                   |                   |
| Diff. score initial-final       | 0.59              | 0.89              | 0.75              |
| Score at slaughter <sup>2</sup> | 3.06              | 3.19              | 3.08              |

<sup>1</sup>Conformation: 1 (fleshless) to 5 (very good conformation);

<sup>2</sup>Level of fattening: 1 (lean) to 5 (excessively fat) a, b: P<0.05

Carcass quality (conformation and level of fattening) was not significantly influenced by the treatments.

The higher yield at slaughter for group W (P<0.05) can be explained by less filling of the digestive tract.



## Conclusions



Appreciable amounts of fresh warm whey may be consumed once daily by beef cattle without causing any health problems.

Animal performance indicators such as growth and carcass quality are not adversely affected by whey feeding.

The experiment will be pursued particularly in order to study joint use of fattening cattle with dairy cows on alpine pastures where cheese is produced.

