Merits of full grazing systems as a sustainable and efficient milk production strategy

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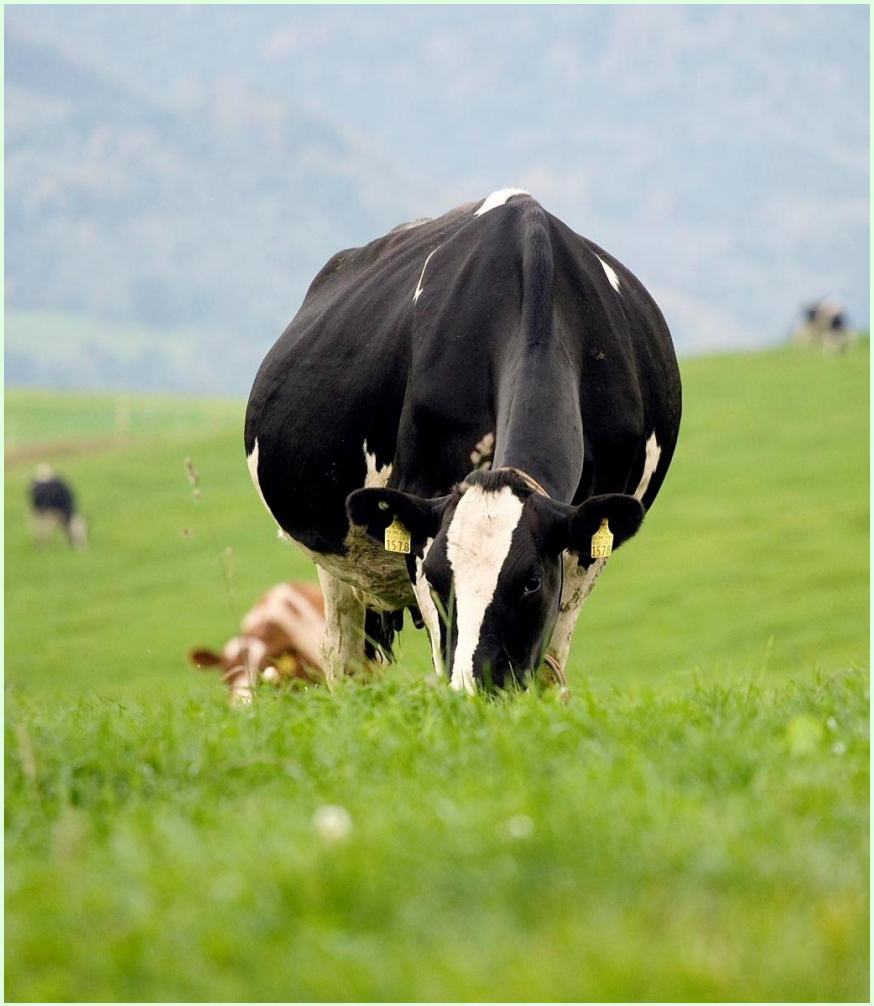
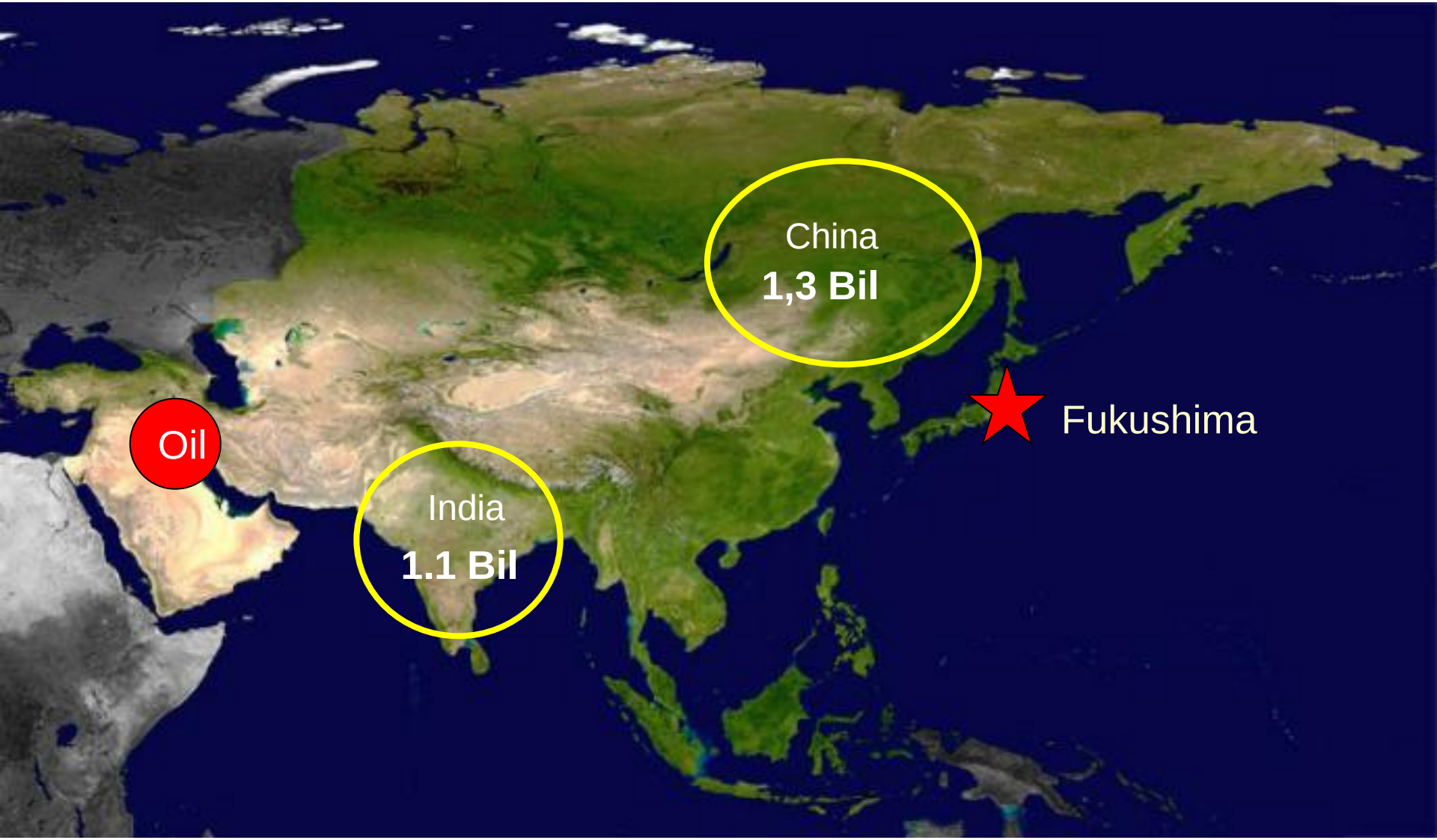
1) A change towards resource efficiency is needed

2) Merits of the pasture-based milk production

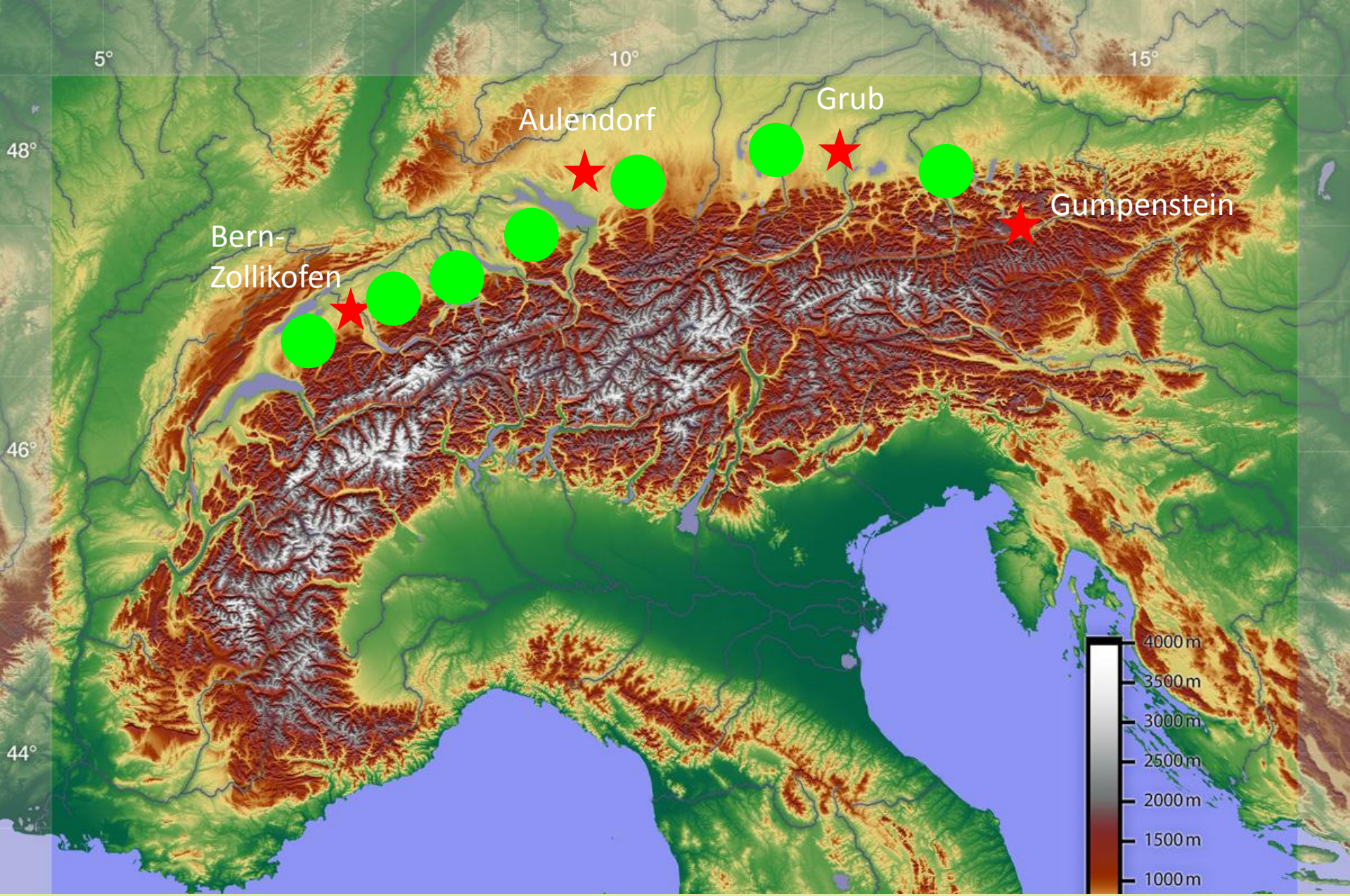
3) Which cow to suit the system?



Changing world



Resource efficiency becomes a key issue in agriculture



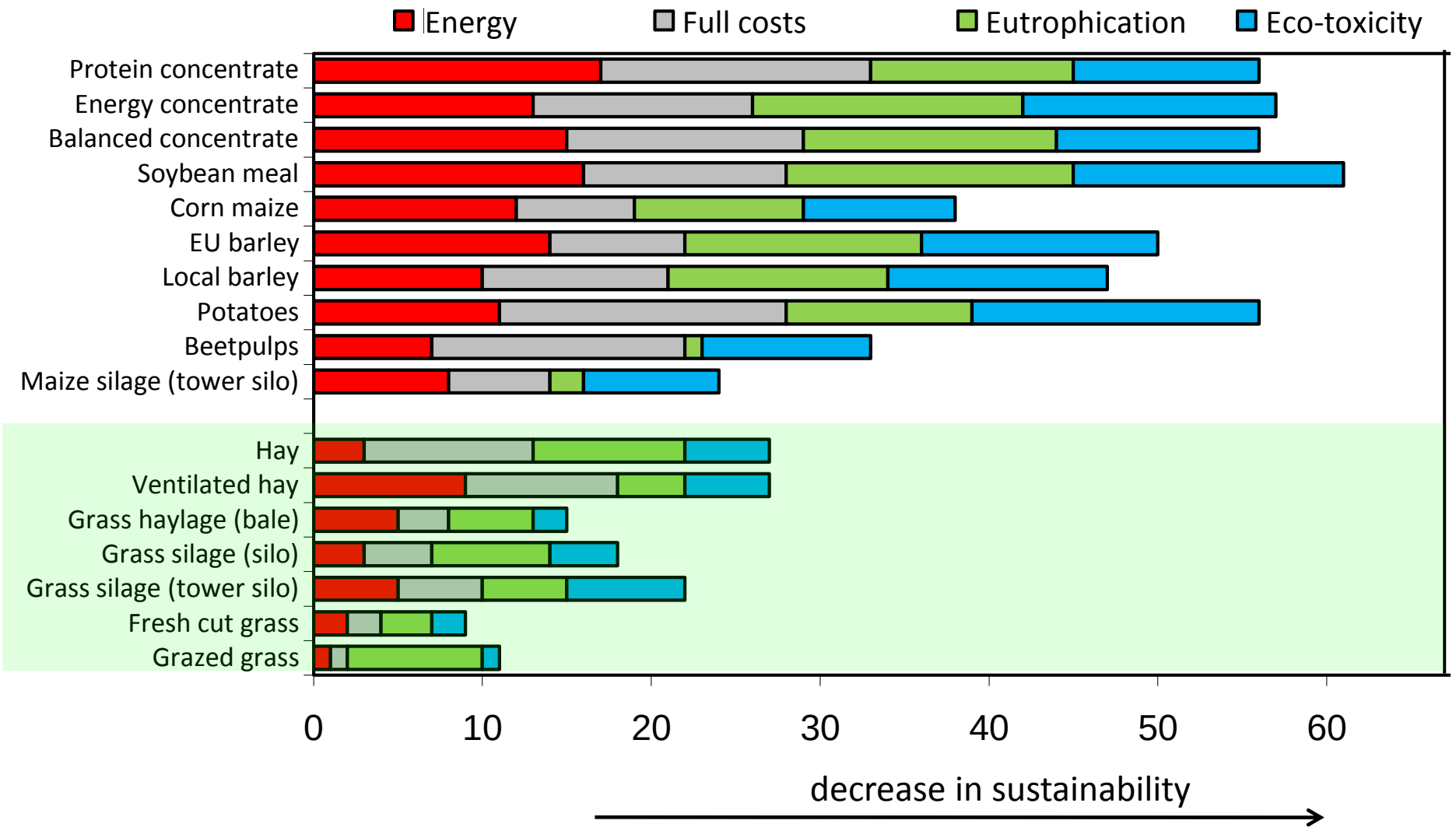
Alpine range with best Grassland areas (green circles)

Average data from dairy farms in 4 countries:

Bayern (D), Baden-Württemberg BW (D), Switzerland (CH), Austria (A)

	Bayern	Baden-W.	CH	A
Size of herd (Cows dairy farm^{-1})	37.2	32.2	18.5	11.2
Milk yield (kg ECM cow^{-1})	7’638	6’198	6’773	6’828
Concentrates (kg cow^{-1} yr^{-1})	2’370	2’079	883	1’300

Ranking of the impact of 17 various dairy cattle feeds on energy efficiency, full costs, eutrophication and eco-toxicity risk (Zimmermann, 2006)

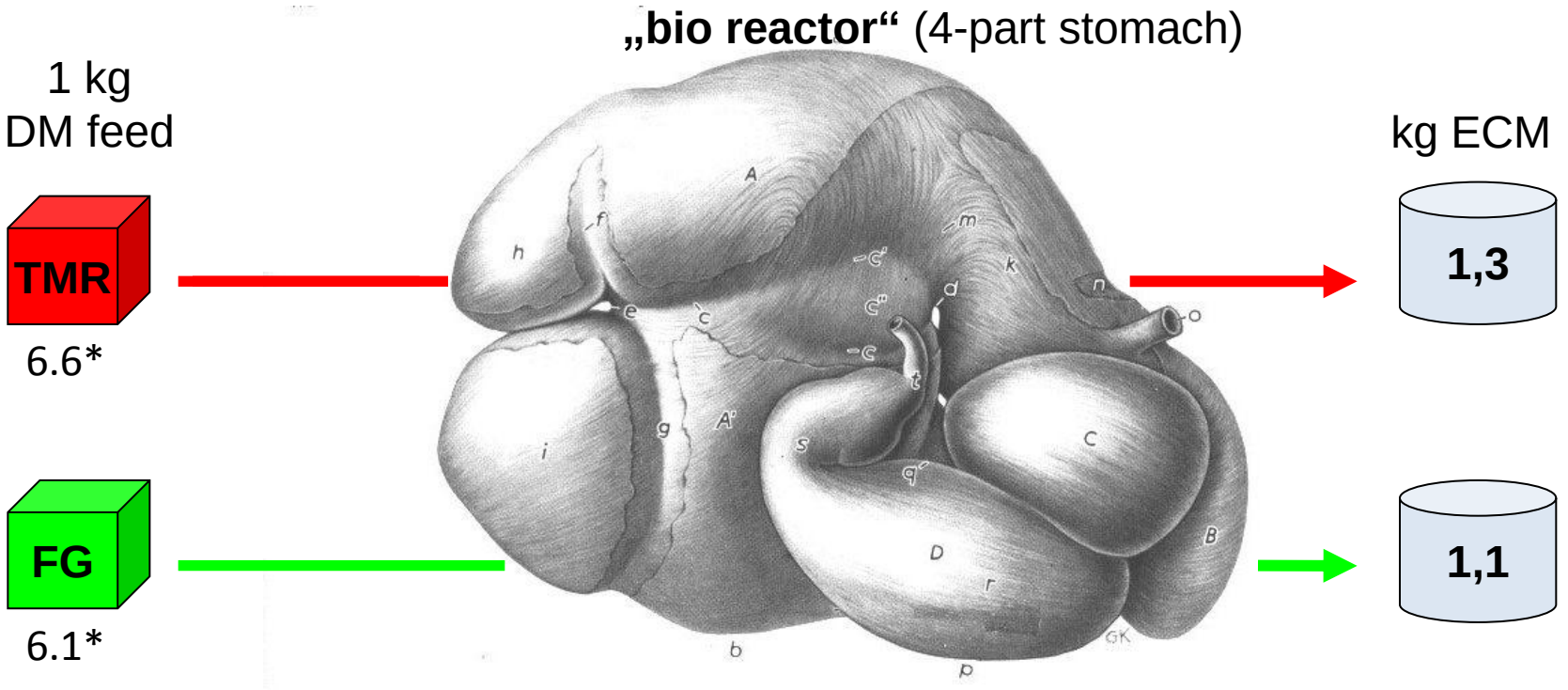


Feed conversion efficiency (FCE)

FCE = kg ECM per kg DM of the annual diet

Confinement system (TMR) *versus* Full grazing system (FG)

9‘000 *versus* 6’000 kg ECM cow $^{-1}$ yr $^{-1}$

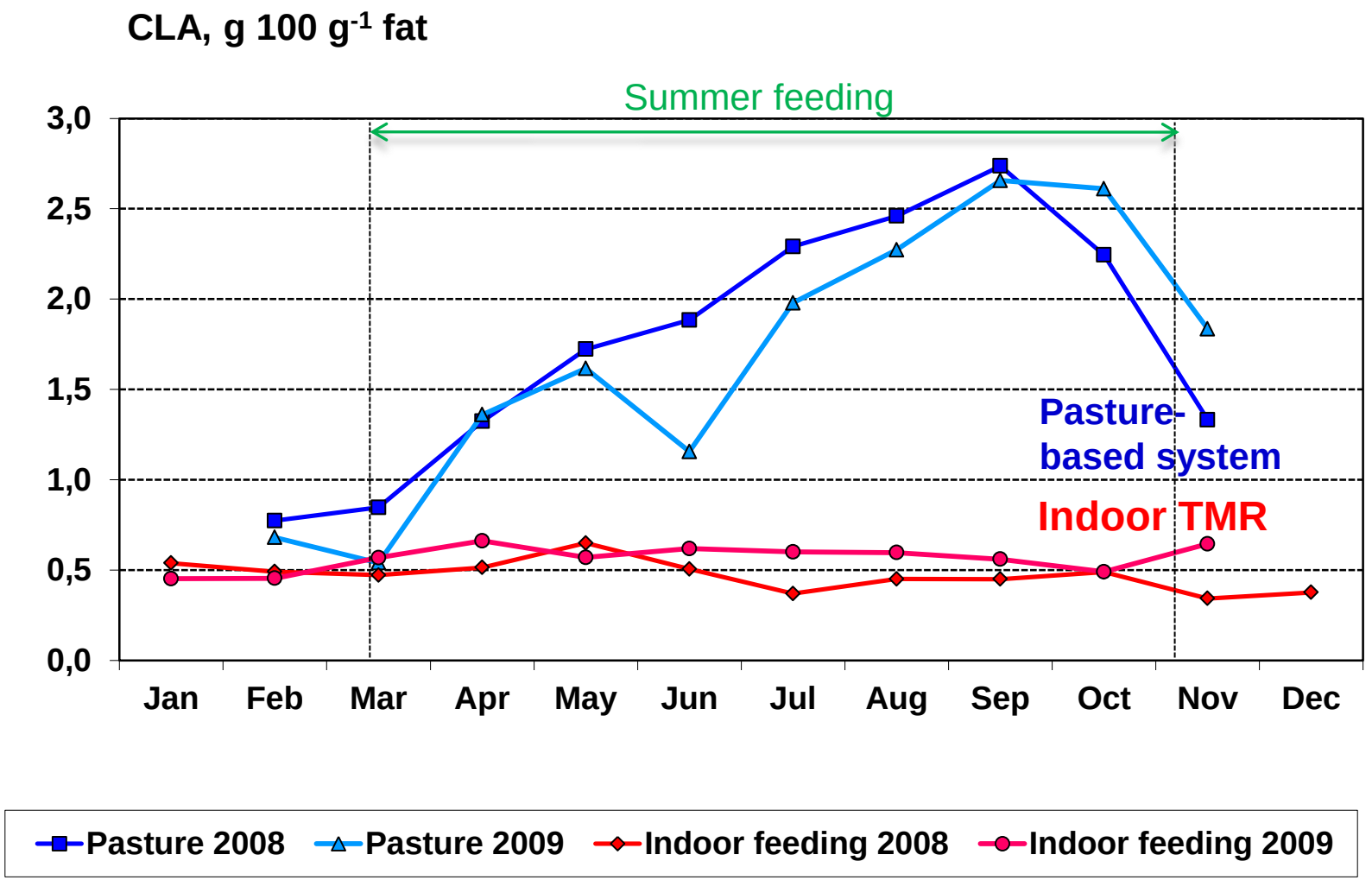


* Energy concentration of the annual diet (MJ NEL kg DM^{-1})

FCE of a dairy herd,
without heifers and replacement

Milk from grass is better

Resultats from a Swiss dairy system comparison study (Hohenrain LU)



Wyss et al. (2010)

Sensory changes with grass-based feed

- ✓ softness and spreadability of butter is improved (Couvreur *et al*., 2006; Mallia 2008)
- ✓ softer cheese body texture *(Bisig, 2011; Martin et al., 2009)*
- ✓ less rancid butter compared to milk with maize silage *(Couvreur et al., 2006)*
- ✓ maize silage feeding results in whiter and less appreciated cheese and butter *(Martin et al., 2009)*
- ✓ even a small proportion of fresh grass (15% of the diet) led to cheeses which were judged with a **more intense and partly more grassy and flowery aroma** *(Martin et al., 2009)*

Summary of the main merits

...which can communicated to the society....

Resource efficiency

Bio diversity

Landscape

Wellbeing of animal and human

Better milk (CLA)

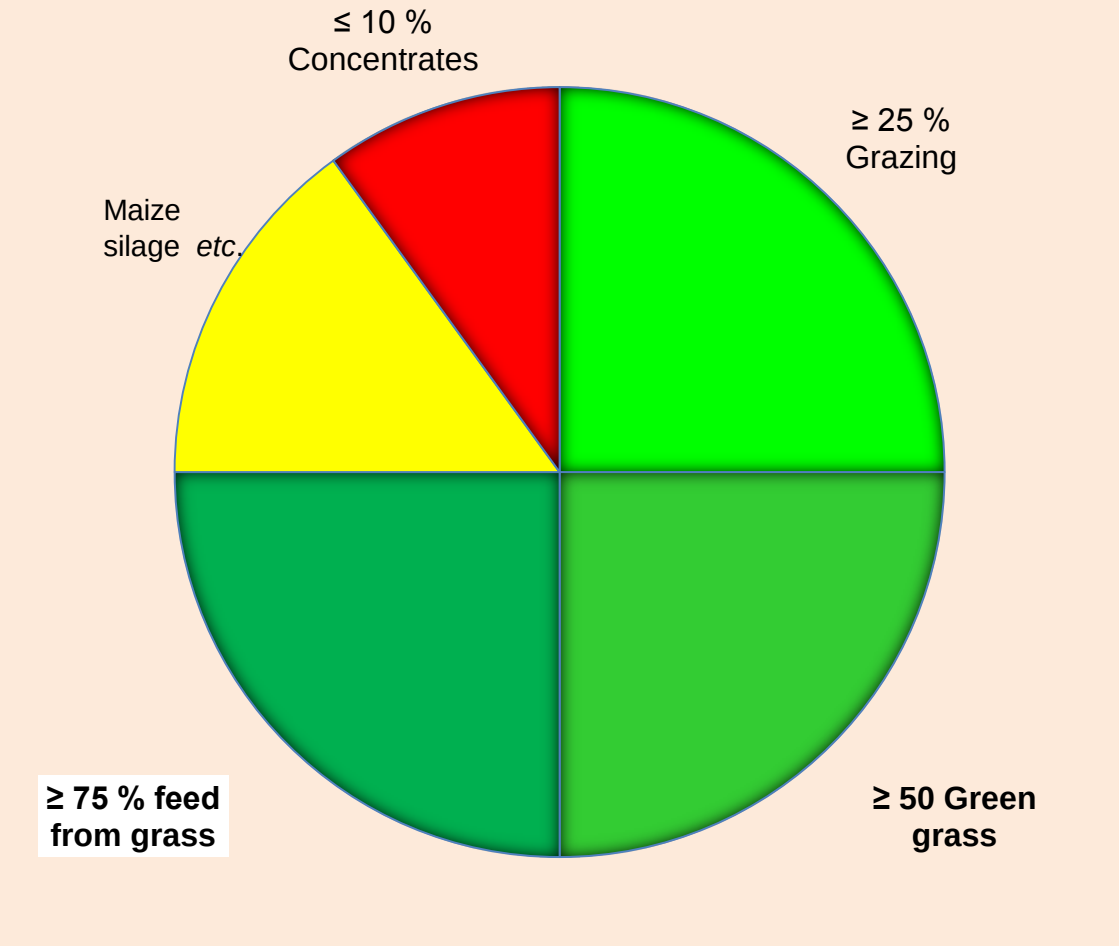
IP-Suisse Pasture milk

+ 6 cents per kg milk

Evaluation system:

1) kg ECM per ha of roughage area
2) Part of grazing in the annual diet
3) Concentrates (g kg^{-1})
4) Green grass in the annual diet (%))
5) Age of the cows (yr)
6) Bio-diversity
7) Animal welfare
8) N fertilisers
9) Communication

Annual diet per cow



Searching a cow to suit the system

The main cow types in the 4 countries.

Holstein
with a lot of dairyness (=barbie)

Austrian Fleckvieh
dual-purpose cow (800 kg)

Breeding for a high annual milk yield per cow →

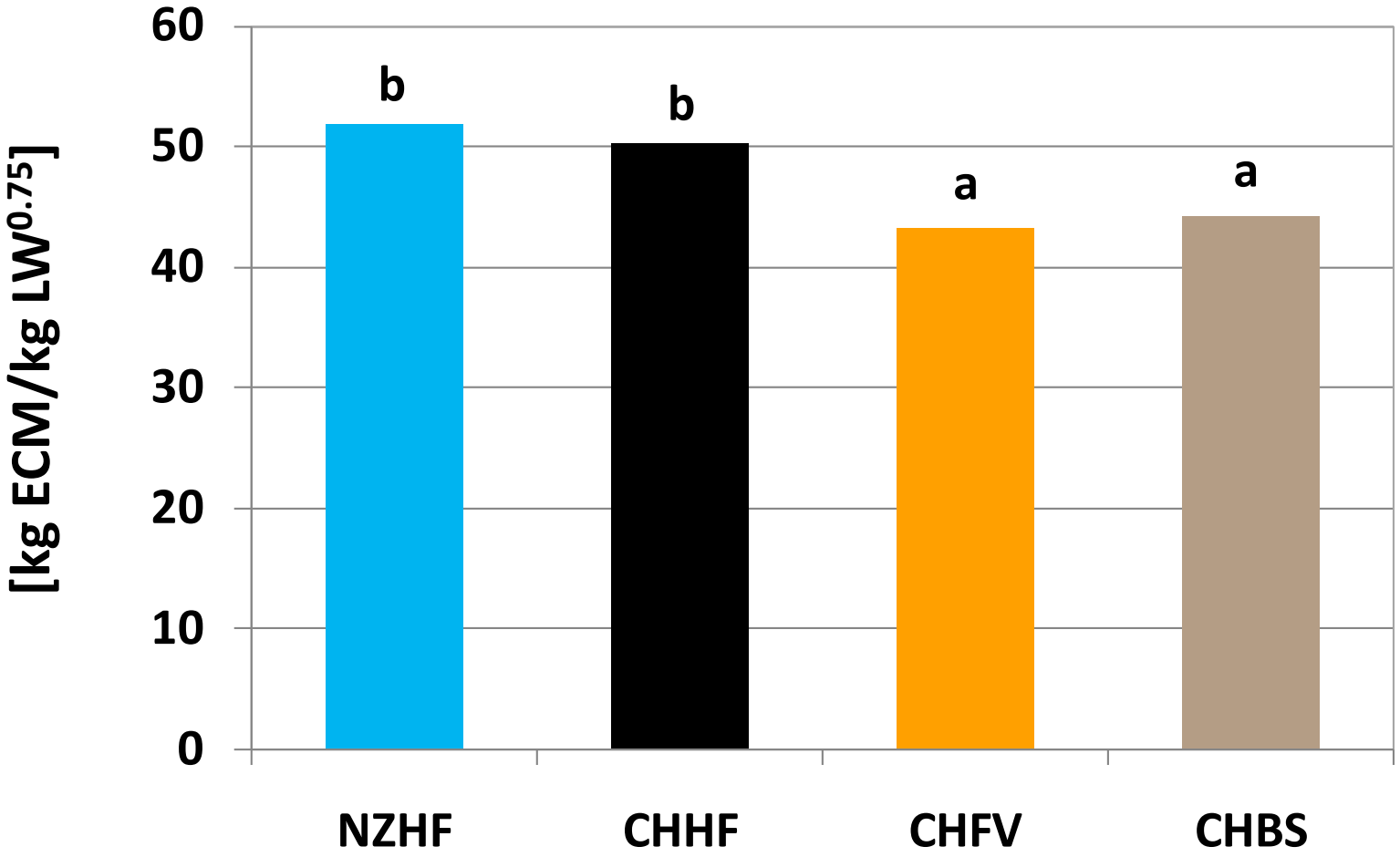
cows became taller and heavier

Comparison of dairy cows managed in a seasonal-calving pasture-based system

New Zealand Holstein Friesian *(NZ HF; n=131 lactations),* Swiss Holstein *(CH HF; n=40),* Swiss Fleckvieh *(CH FV; n=43);* Swiss Brown Swiss *(CH BS; n=45)*

Milk production efficiency

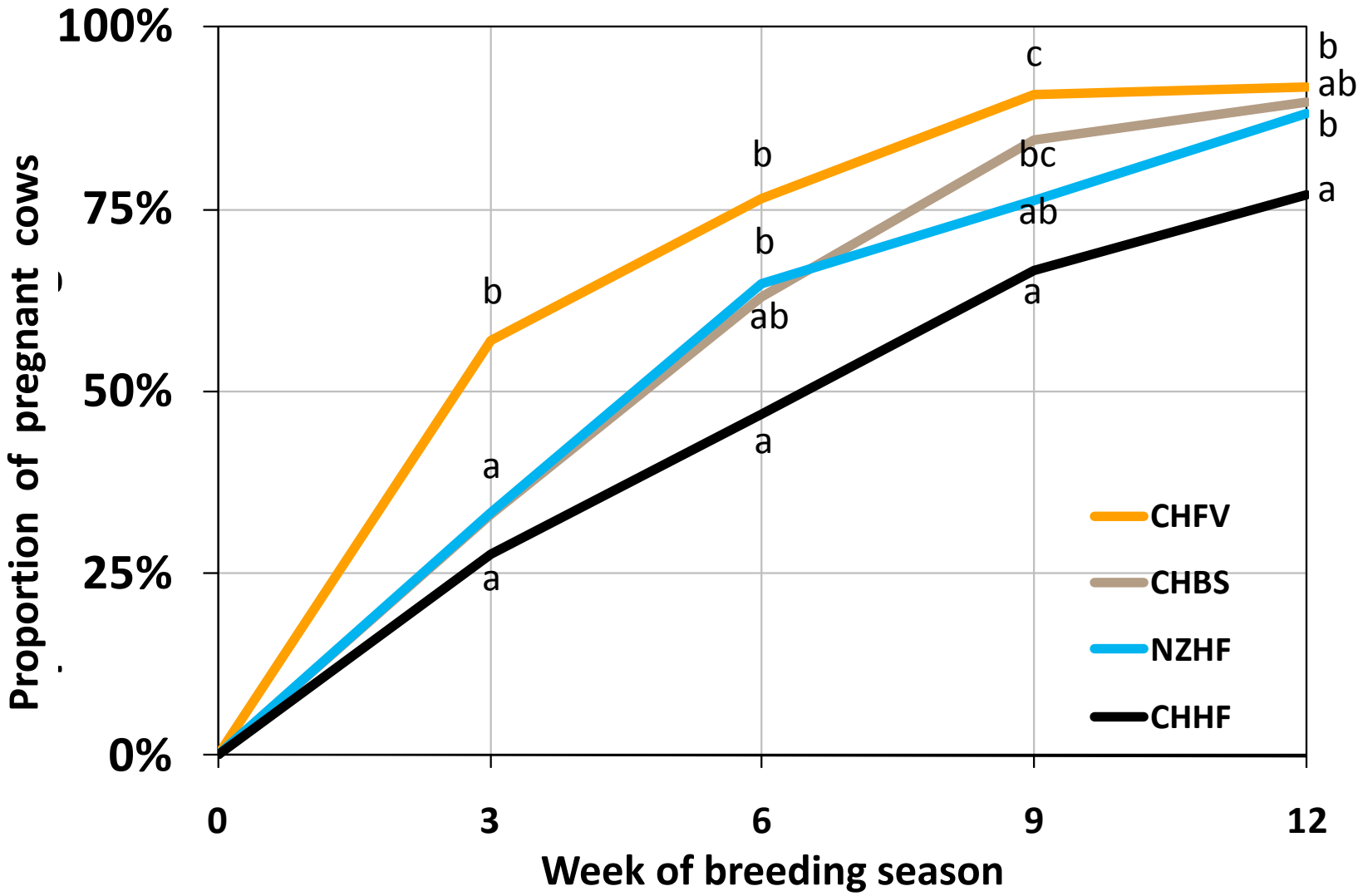
kg ECM per kg metabolic body weight



	NZHF	CHHF	CHFV	CHBS
Average body weight (kg)	513	590	611	523

Reproduction performance

Proportion of pregnant cows within 3, 6, 9 and 12 weeks of the breeding season



Eating behaviour of the tested cows

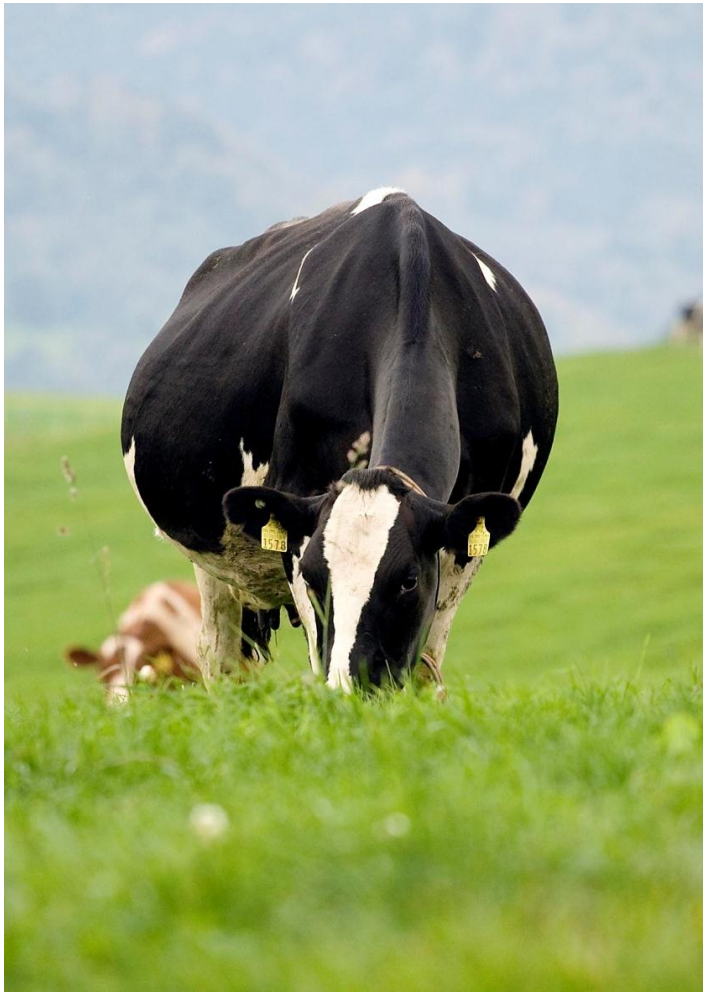
On dung patches	NZ n = 28	CH n = 28
Eating time (s/min)	**16.3**[a]	**6.9**[b]
Eating frequency (bites/min)	60.5[a]	62.4[b]

When compared to Swiss cows, NZ Holstein Friesian cows graze for a longer periods around dung patches with a higher food supply.

Summary

...messages to the dairy breeders....

- Accountabilty of body weight (kg ECM/kg BW_{met}^{-1})
- Differentiation of production systems (Confinement – Full grazing)
- Longevity and reproduction performance
- Willingness to graze; intake capacity



Conclusions

- Main merits of the full grazing milk production system: resource-efficient, environment, animal and human friendly.
- Milk and dairy products produced from pasture has a unique composition with beneficial nutritive values (CLA, n3:n6) and sensory properties
- Grazing systems have a high production potential, but relies on a high degree of managerial competence.
- Animal breeding programmes should have increased consideration of the key profit drivers for farmers (kg ECM per kg metabolic BW, fertility, longevity)