

Long term farm study of organic milk production – moderate concentrate inputs and high milk yields on Tingvoll farm

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Implications

Long term studies of organic milk production on a Norwegian organic farm (Tingvoll farm) show that it is possible to achieve high milk yields with moderate concentrate inputs in organic milk production with Norwegian Red Cattle. The milk yields at Tingvoll farm were generally higher, and the concentrate input lower than the average of all Norwegian dairy farms. Average annual milk yields, as well as annual concentrate consumption per cow increased during the study period both for organic and conventional dairy production in Norway. The results from Tingvoll farm may inspire conventional dairy farmers to convert, since the differences to organic production are not necessarily too large. Alternatively, they may be inspired to reduce their concentrate inputs.

Background and objectives

Organic milk production was established at Tingvoll experimental farm during 1989-1994. The objectives for the milkproduction where high yield, high roughage intake and low concentrate inputs. Since then, annual records of fodder production, milk yields etc. have been collected. In this paper, we present results for annual average milk yields and concentrate consumption for the period 1991-2012, to discuss the changes in the levels of these characteristics over time.

Key results and discussion

Likewise to the development for most other Norwegian dairy farms, the number of cows, concentrate inputs and milk yield increased considerably at Tingvoll farm during the study period (Table 1 and fig 1). The yields increased rapidly from 2006.

Table 1: Milk yield and feed units concentrate per cow eq at Tingvoll farm, at organic dairy farms in Norway and at all dairy farms in Norway.

	2002			2008			2011		
	TF	Org	Coun	TF	Org	Coun	TF	Org	Coun
No. of herds	1	249	17 137	1	281	11 794	1	294	8 935
Cow eq. per herd	13.6	15.8	15.3	19.9	23.1	19.8	20	26.4	22.1
Kg ECM/ cow eq	6410	5024*	6278	7 300	6 448	7 144	8 204	6 771	7 309
Feed units concen- trate/100 kg ECM	16	17*	27	20	22.8	28.3	23	24.7	29.9

TF= Tingvoll farm, Org=average for organic dairy farms in Norway, Coun= National average of dairy farms. ECM=energy corrected milk. Feed units = net energy lactation, and 1 feed unit is equal to 1 kg of barley.

* Not energy corrected milk

The feed rations at Tingvoll farm changed significantly during the study period. Whereas 6 different feedstuffs were used in 1996 (Table 2), only silage, concentrate and hay were used in 2012. The pasture share of the total diet was reduced from 36.8% in 1996 to 13.9 % in 2012. Until 2011 the cows grazed day and night. However, after a loose housing barn was built in 2011, the cows grazes only during daytime. The calving season has changed from concentrated spring and early summer calving, in 1991-2006, to an even distribution over the whole year. The changes in management should be seen in light of increase in milk quota over time, which has increased the herd size, reduced the input of forage per cow and increased the farmer's income per man hour. Tingvoll farm

has a somewhat higher milk yield and less concentrate input per 100 kg ECM than the average of Norwegian farms.

In Norway, concentrates are usually purchased, even on farms where cereals may be grown. Especially for organic produced concentrates, the ingredients are often imported from abroad, and protein concentrate is hardly produced in Norway at all. The development towards less forage and more concentrates in the diet of organic cows is criticized for not being environmentally sustainable. For the farmers it is clearly economically beneficial.

Fig. 1: Kg energy corrected milk per cow eq and feed units concentrate per 100 kg ECM.

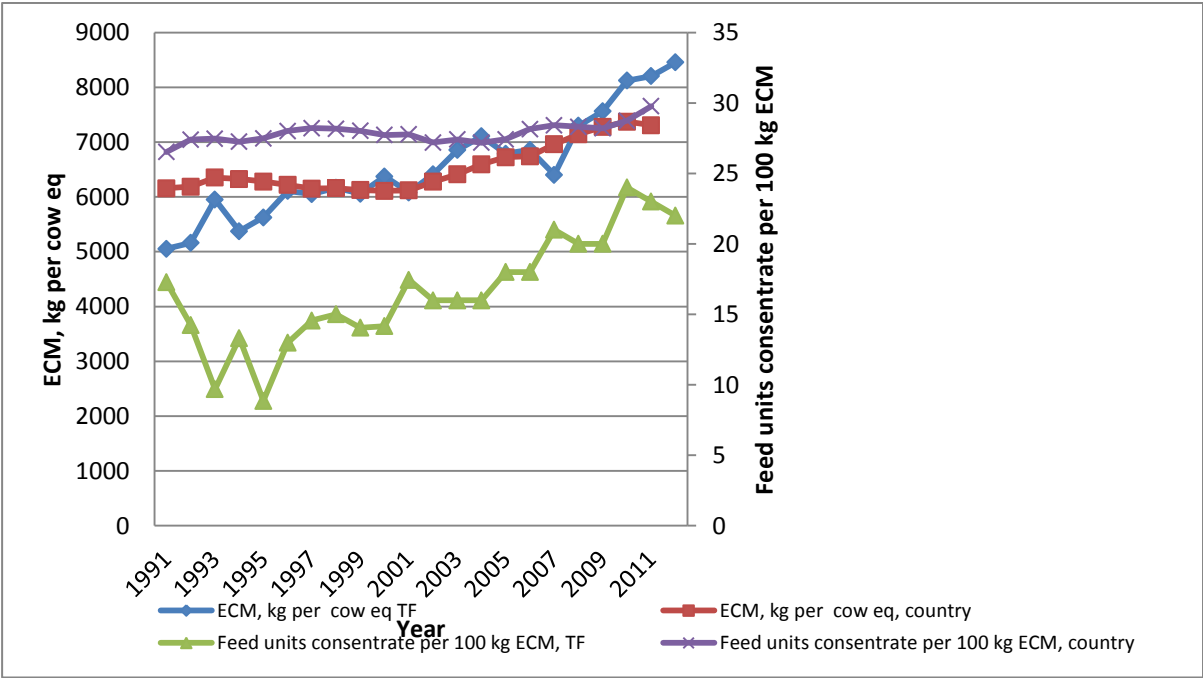


Table 2: Composition of the feed ration for dairy cows at Tingvoll farm in 1996 and 2012, on a feed unit basis.

	Year 1996	Year 2012
Total number of feed units	5 118	5 739
% concentrate	15.5	32.9
% pasture	36.8	13.7
% silage	37	53.4
% hay	9.2	
% potatoes	1.5	
% other feedstuffs	0.1	

How work was carried out?

Parameters from Norwegian herd recording from Tingvoll farm, all Norwegian organic dairy farms and all dairy farms in Norway (organic and conventional) were used in this study.

References

Olesen, I., Lindhardt, E., Ebbesvik, M., 1999. Effects of calving season and sire`s breeding value in dairy herd during conversion to ecological milk production. Livestock Production Sciencel 6, 201-211.