

Organic milk production in Finland, Norway, Denmark and Sweden



Overview prepared for the course: Organic milk production in the Nordic countries in Uppsala the 27th of April 2016.

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Questionnaire, organic milk production in your country

The questions below was formulated and was answered for each country as well as possible!

- 1) Number of organic dairy cows
- 2) Total delivery of organic milk to the dairies 2015, development during the last 5 years if possible
- 3) Main dairies in the country
- 4) Average herd size
- 5) Average area to an organic dairy farm (hectare arable land and hectare permanent grassland)
- 6) Breeds in organic production or in the country as a whole (% distribution)
- 7) Average milk yield per cow per year in organic production
- 8) Typical organic feed ration for the country (best guess for the winter period)
- 9) Grazing period and average intake of pasture (estimate)
- 10) What type of roughage is used mainly (grass clover, maize, whole crops – percentage and quality (digestibility/energy, crude protein))
- 11) Typical clover grass mixture on an organic dairy farm (for cutting)
- 12) Average roughage percentage in the feed ration for the whole lactation (estimate)
- 13) Typical composition of concentrate mixture, (bas mixture, top mixture)
- 14) Health data: % Dead cows; % dead calves (1-180 days); Cell number; Longevity cows
- 15) What do you experience is the biggest challenge for organic milk production in your country?
- 16) Important websites for information concerning organic dairy production

Organic milk production in Finland

Pirkko Tuominen, ProAgria Pohjois-Savo

- 1) Number of organic dairy cows
 - a. in 2015 total amount of 8438 organic milking cows at 153 farms (ref. Evira) – all dairy cows in Finland total of 282 200 (ref. Luke)
- 2) Total delivery of organic milk to the dairies 2015, development during the last 5 years
 - a. 2015 organic milk 54,17 mill.l - conventional 2324,57 mill. l (ref. Luke)
 - b. 2014 org. milk 47,17
 - c. 2013 org. milk 41,21
 - d. 2012 org. milk 37,57
 - e. 2011 org. milk 31,39
- 3) Main dairies in the country
 - a. Valio 44 600 000 litres
 - b. Arla (6 000 000 l???)
 - c. Juustoportti 3 000 000 l
 - d. Suomisen Maito
- 4) Average herd size
 - a. in 2015 average of 55,2 cows/farm (ref. Evira)
- 5) Average area to an organic dairy farm (hectare arable land and hectare permanent grassland)
 - a. this is a difficult question as the area varies a lot between different size of herds (20 vs 300 milking cows) and the location of the farm and also the level of co-operation with neighboring organic farms.. The estimates from different parts of Finland varied from 60 to 250 ha. The very rough average of arable land per farm might be around 150 ha. Maybe a couple of hectares of permanent pastures, which are mainly forest areas – not much of importance as pasture in Finland.
- 6) Breeds in organic production
 - a. ayshire 55,4 % (ref. ProAgria)
 - b. holstein 38,7 %
 - c. finncattle 5,3%
 - d. jersey 0,1 %
- 7) Average milk yield per cow per year in organic production
 - a. the average milk yield in the official records of ProAgria (including about 70% of the organic dairy farms) 8448 l/day
- 8) Typical organic feed ration for the country (best guess for the winter period)
 - a. 65% of the dry-matter intake is roughage (mainly grass-clover, about 20% whole crops) – 35% of the dry matter intake is cereal / concentrates (barley, oats, some wheat, peas, faba beans and spring rape) – and minerals
- 9) Grazing period and average intake of pasture (estimate)

- a. in southern Finland from mid May until end of September, further North from the beginning of June until mid September
 - b. intake of pasture varies a lot depending on the location of the farm + the location of the fields. Can be anything between 25 – 100 % of the roughage intake during pasture-season. No statistics available.
- 10) What type of roughage is used mainly (grass clover, maize, whole crops – percentage and quality (digestibility/energy, crude protein))
- a. grass clover 75-85% (results of 1304 samples from summer 2015, average of all cuts): D-value 663 g/kg DM, ME 10,6 MJ/kg DM, crude protein 126 g/kg DM, NDF 514 g/kg DM)
 - b. whole crops 25 – 15%
- 11) Typical clover grass mixture on an organic dairy farm (for cutting)
- a. timothy 40-60%, meadow fescue and tall fescue 20-40%, perennial rye grass 10-20%, red clover 10-20%, alsike clover 5 – 15%, white clover 0-5 %
 - b. some lucerne is also used (especially in the Southern parts of Finland)
- 12) Average roughage percentage in the feed ration for the whole lactation (estimate)
- a. 65-70%
- 13) Typical composition of concentrate mixture, (bas mixture, top mixture)
- a. barley, oats, wheat, peas, faba beans and spring rape (Brassica rapa) + imported rapeseed (Brassica napus) – only one producer uses organic soya in one top mixture
- 14) Health data: % Dead cows; % dead calves (1-180 days); Cell number; Longevity cows

(ref. ProAgria)	Organic	Conventional
Age of cows leaving (month)	64,8	62,4
Somatic cells (1000)	173	153
Calves born dead (after 7 mths in-calf) + died under 7 days (%)	8,1	6,3
Out sorted cows, all (%)	31,6	31,4
Out sorted first calfers (%)	19,3	17,0

- 15) What do you experience is the biggest challenge for organic milk production in your country?
- a. dairies are not interested to buy more organic milk, the price of organic milk is also declining
 - b. lack of arable land in some areas
 - c. long winter season (need to make a lot of silage in a very short period = a lot of land needed, effective machinery and storage facilities needed)
- 16) Important websites for information concerning organic dairy production
- a. <http://www.evira.fi/portal/en/about+evira/themes/organic+production/> organic certification (Finnish main page: <http://www.evira.fi/portal/fi/tietoa+evirasta/asiakokonaisuudet/luomu/>)
 - b. <https://www.proagria.fi/en/sectors/organic-farming> ProAgria advisory centres (Finnish main page: <https://www.proagria.fi/toimialat/luomutuotanto>)
 - c. <http://luomu.fi/>

1) Number of organic dairy cows

The number of organic dairy cows is about 56.000. That equals about 11 % of the Danish dairy cows.

2) Total delivery of organic milk to the dairies 2015 and development during the last 5 years

Since 2011 the delivery of organic milk has been a quite constant on 480 million kilo. organic milk per year. However there is a slight decrease in 2015 to 465 million kilo due to large herds converting back to conventional production.

Production in Jan/Feb 2016 and Jan/Feb 2015: 83 and 74 million kilo. (+ 12 %)

3) Main organic dairies in the country

Arla, Thise, Naturmælk, Them, Øllingegaard

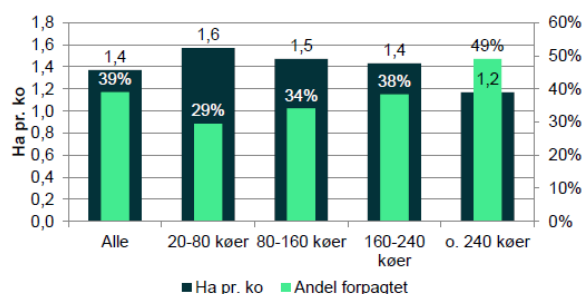
4) Average herd size and number of organic dairy farms

There are 348 organic dairy farms (May 2015) with an average herd size of 169 cows (2014/15: 159 cows).

At present 50 dairy herds are converting to organic milk production and a forecast says, that a similar number will convert later this year.

5) Average area to an organic dairy farm (hectare arable land and hectare permanent grassland)

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Average area is about 225 hectare. The green mark shows how much of the land is rented.

I found no data for permanent grass.

6) Breeds in organic production

Holstein, Jersey, Red Danish, Red Holstein and crossings

7) Average milk yield per cow per year in organic production

Actual yield: 9.498 kg ECM per cow (RYK). Conventional: 10.500 kg ECM.

8) Typical organic feed ration for the country (best estimate for winter period), kg DM/cow per day

Data (DMS) from 130 (summer)/ 124 (winter) herds with organic large breed

Top organic feed during winter:

Feed	% of herds	Kg DM/cow/day
<u>Roughage:</u>		
Grass silage	>90	6-12
Whole crop silage	60	4-5
Corn silage	55	4,0
Straw (barley)	37	0,4
<u>Concentrate/grain:</u>		
Com. Mix	>85	2-6
Barley	72	2,3
Oats	43	1,6
Rye	35	1,9
Soy-cake	18	1,2
Field beans	15	1,2

Top organic feed during summer:

Feed	% of herds	Kg DM/cow/day
<u>Roughage:</u>		
Fresh grass (clover-mix)	100	5-8
Grass silage	>80	3-4
Corn silage	51	3-4
Whole crop silage	32	2
Straw	48	0,3
<u>Concentrate/grain:</u>		
Com. Mix	>75	2-6
Barley	70	2,0
Oats	49	1,5
Rye	40	2,0
Soy-cake	25	0,8
Field beans	8	0,9

9) Grazing period and average intake on pasture (estimate)

15th April – 1st November. Average intake: 5-8 kg DM per cow per day over season

10) What type of roughage is used mainly See no. 8 above

11) Typical clover/grass mixture on an organic dairy farm (for cutting)

Ryegrass, white and red clover, festulolium (rajsvingel).

12) Average roughage percentage in the feed ration for the whole lactation (estimate)

65 (rough estimate!). Early lactation: 50

13) Typical composition of concentrate mixture

Soy-beans, soy-cake, rape, sunflower, grain (barley, rye, oats),

14) Health data: % dead cows; % dead calves (1-180 days) Cell number, Longevity cows

% dead cows: 3,3

% dead calves (1-180): 8,2

% born dead: 5,7

Cell number: Bulk: 210.000; Calculated: 240.000

Longevity cows: 65 months

15) What do you experience is the biggest challenges for organic milk production in your country?

- Capital: Binding/return
- Area: Grazing in large herds and production of roughage
- Feed: Quality of roughage / local grown concentrate
- Health: Dead calves
- Economics: Future milk price?

16) Important websites for information concerning Organic dairy production

www.seges.dk

www.landbrugsinfo.dk/Oekologi

www.landbrugsinfo.dk

www.icrofs.dk

www.okologi.dk

Organic milk production in Norway

Birgit Tverås / Erik Brodshaug TINE SA

1) Number of organic dairy cows

- a. In 2014 there were 8.226 organic cows in Norway. The number of organic dairy cows increased with 61 cows to total 8287 in 2015 (276 farms, average 30 cows)

2) Total delivery of organic milk to the dairies 2015, development during the last 5 years if possible

Tabell 10: Total cow milk, Norway (mill. litre)

		Organic, mill. litre	Organic, percentage
2005	1 511	25,6	1,7 %
2012	1 531	53,9	3,5 %
2013	1 525	54,5	3,6 %
2014	1 509	51,8	3,4 %
2015	1 536	51,4	3,4 %
Change last year	1,8 %	-0,8 %	

3) Main dairies in the country

TINE SA, Q-dairies

Total delivery of conventional and organic milk to TINE was in 2015: 1.454 383 thousand litres milk and for the Q-dairies it was 81 853 thousand litres

Other dairies where TINE is supplier of raw milk: Rørosdairy, Synnøve Finden. Only TINE SA and Rørosdairy producing organic products.

4) Average herd size

Average herd size in 2015 was 30 cows in organic herds and 25 cows in conventional herds according to statistics "Kukontrollen" TINE SA

- 5) **Average area for an organic dairy farm (hectare arable land and hectare permanent grassland)** This is a difficult question as the area varies a lot between different sizes of herds and in different areas. In 2011 the average organic herd had about 430 da / 43 hectares
Varies about 10 vs 70 milking cows and the location of the farm, wet vs dry.

6) Breeds in organic production or in the country as a whole (% distribution)

In Norway NRF (Norwegian Reed) is the dominant breed in both conventional and organic farms. NRF is a combined breed (milk/beef) Other breeds (small percentage) Jersey, Holstein and some old Norwegian breeds

7) Average milk yields per cow per year in organic production

The average milk yield in 2015 was 6.940 kg EKM/cow/year. This is from statistics "Kukontrollen" TINE SA. In conventional herds the average milk yield was 7.726 kg EKM / cow/year.

8) Typical organic feed ration for the country (best guess for the winter period)

For a cow producing 35 kg ECM, it could look like this: 9-11 kg DM clover/grass silage, 2-3 kg DM whole-crop silage oats+barley+faba beans(vicia sativa sativia), 8-10 kg concentrate. Concentrate are 70% (mix of wheat, barley+rye+oats), 30% (peas, soya and rapeseed cake)

66% of the dry-matter intake is roughage (mainly grass-clover, about 20% whole-crop silage) – 34% of the dry matter intake is cereal/concentrates (barley, oats, some wheat, peas, faba beans and spring rapeseed meal) – and minerals

9) Grazing period and average intake of pasture (estimate)

- a. In southern Norway from May until end September, further North from the beginning of June until mid September.
- b. Intake of pasture varies a lot depending on the location of the farm + the location of the fields. Can be anything between 25 – 100 % of the roughage intake during pasture-season. No statistics available.

10) What type of roughage is mainly used (grass clover, maize, whole crops – percentage and quality (digestibility/energy, crude protein))

According to TINE advisory service (TINE Rådgivning), the average dairy cow diet in organic production is: Concentrate (grain based) 34%, Grass/clover silage 45%, pasture 11% and other feedstuffs (mainly whole crop silage) 9% calculated on energy basis. Traditionally concentrate and silage are fed separately. The dominating silage preservation method is making round bales. Organic grass/clover silage quality in 2015, analysed at Eurofins by NIRS, is presented in the Table.

Table. Silage quality of organic grass clover silage in 2015, average and standard deviation (Source: TINE Rådgivning)

Cutting number (number of samples)	Organic Matter Digestibility	Crude protein	NDF	Nel ₂₀
	(%)	g/kg DM	g/kg DM	MJ/kg DM
1 (150)	72.6 (5.03)	125 (18.7)	519 (55.8)	6.01 (0.487)
2 (107)	71.9 (3.34)	141 (21.1)	470 (46.6)	5,92 (0.342).

11) Typical clover/grass mixture on an organic dairy farm (for cutting)

There are organic grassland cultivation in most parts of Norway, stretching from approximately 58° to 71° North in latitude and covering oceanic and continental type of climates. This of course has an impact on the length of the growing season, on how many cuts it is possible to take (from 1 to 4 cuts per season) and on which grassland species and cultivars that is feasible to cultivate. However, the dominating species used in short term leys are very much the same, i.e. timothy, meadow fescue, red clover and white clover. In coastal areas, and in areas with long growing season, perennial ryegrass is also included in the mixture. In some areas where leys are cut frequent, cocksfoot (*Dactylis glomerata*) is used, and in dry areas smooth broomgrass (*Bromus inermis*). Smooth meadow-grass (*Poa pratensis* L) is also used in mixtures that is planned to last for more than 3-4 years and in leys that are utilized both for grassing and cutting.

A typical grassland mixture in Norway used for cutting will be:

Red clover: 5-15 %

White clover: 5-10 %

Timothy: 55-70 %

Meadow Fescue: 15-20 %

Perennial ryegrass (replacing some of the meadow fescue): 10 %

A typical grassland mixture in Norway used for cutting and grassing will be:

White clover: 15 %

Timothy: 40-55 %

Meadow Fescue: 15-20 %

Smooth meadowgrass 15 %

Perennial ryegrass (replacing some of the meadow fescue): 10 %

12) Average roughage percentage in the feed ration for the whole lactation (estimate)

a. About 66 %

13) Typical composition of concentrate mixture, (bas mixture, top mixture)

a. Barley, oats, wheat, peas, faba beans and spring rape (Brassica rapa) + imported rapeseed (Brassica napus) – only one producer uses organic soya in one top mixture

14) Health data: % Dead cows; % dead calves (1-180 days); Cell number; Longevity cows

	Organic	Conventional
Age of cows leaving (month)		
Somatic cells (1000)	137	128
Calves born dead +died under 7 days (%)	4,4	3,8
Out sorted cows, all (%)	41,2	41,8
All disease treatment pr cow/year	0,34	0,53

15) What do you experience is the biggest challenge for organic milk production in your country?

Almost all the organic grains are imported.

We are producing more organic milk (over all) to a higher price (0,65) which are not used for making organic products (38% in 2010 to 54% in 2015)

Protein level in the grass silage.

16) Important websites for information concerning organic dairy production

<https://medlem.tine.no/>

www.debio.no

www.nlr.no/

www.agropub.no/

www.oikos.no/

www.slf.dep.no › Hjem › Miljø og økologisk

Organic milk production in Sweden

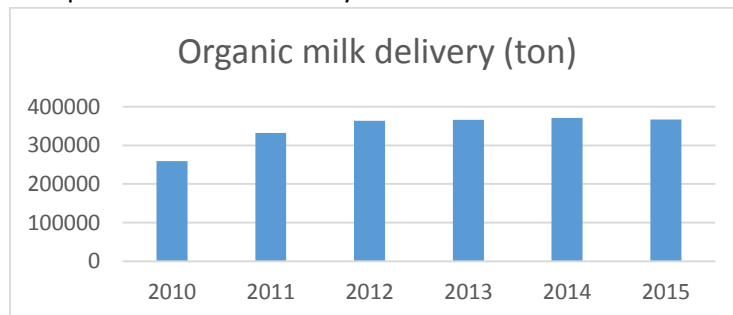
Niels Andresen, Jordbruksverket

1) Number of organic dairy cows

In 2014 there were 46900 organic dairy cows in Sweden, which is ca 13% of the whole cow population. The number of organic dairy cows increased with approximately 12500 cows from 2009 to 2011 and the last 5 years the total number has been rather stable. However, now the conversion has increased again due to the demand on the market.

2) Total delivery of organic milk to the dairies 2015, development during the last 5 years if possible

The delivery of organic milk was approximately 367000 ton 2015. This is around 12,5 % of the milk produced in the country.



3) Main dairies in the country

Arla, Skånemejerier (Lactalis), Norrmejeri. Smaller regional dairies: Falköpings mejeri, Gävleortens mejeri.

4) Average herd size

Average herd size in 2014 was 86 cows in organic herds and 78 cows in all herds according to official statistics. There were 548 organic herds which is around 12,5 % of all dairy herds. An estimated herd size for 2015 is 89 cows in organic herds and 81 cows for all dairy herds. For herds in milk recording the average herd size in 2015 for organic herds was 93 cows and for conventional herds 82 cows.

5) Average area to an organic dairy farm (arable land and hectare permanent grassland)

In 2014 a dairy farm had an average land area of 168 ha arable land and 29 ha of permanent grassland (total area of 198 ha).

Most dairy herds have more than 100 ha arable land, 86 % of the organic dairy cows were on farms with more than 100 ha arable land.

6) Breeds in organic production or in the country as a whole (% distribution)

There is no statistics for this concerning organic production. But for the whole dairy cow population, the distribution of breeds in milk recording is:

38,1 % Swedish Red and White, 54 % Swedish Holstein, 0,3 % Swedish landrace cow (Fjellkor), 0,7 % Swedish Jersey and 6,8 % crossbreeds.

7) Average milk yield per cow per year in organic production

The average milk yield for an organic cow is 9044 kg ECM 2015, which is nearly 1000 kg ECM less than for the conventional cow.

8) Typical organic feed ration for the country (best guess for the winter period)

For a cow producing 35 kg ECM, it could look like this: 13 kg DM clover/grass silage; 2 kg DM whole crop silage (barley/oat/peas); 5-6 kg cereals; 2-3 kg protein concentrate. In most cases protein concentrate is bought to the farm and soya is the main protein component in many commercial feeds. Protein concentrate is exchanged partly with field beans on many farms. Rape cake is used on some farms in the south but not in large quantities. However, rape products are common in commercial feeds.

9) Grazing period and average intake of pasture (estimate)

Minimum intake of pasture, 6 kg DM per day according to KRAV rules
 4 months in the south of Sweden (average 1000 kg DM, variation 720 – 1500 kg DM)
 3 months in the middle of Sweden (average 700 kg DM, variation 540 – 1500 kg DM)
 2 months in the north of Sweden (average 400 kg DM, variation 360 - 700 kg DM)
 Cows should have access to outdoor areas in 2 months more than the grazing period according to KRAV.

10) What type of roughage is used mainly (grass clover, maize, whole crops – percentage and quality (digestibility/energy, crude protein))

Clover/grass silage is the main roughage in the winter period. No statistics on that but a qualified estimate would say that 85-90 % of the roughage will be clover/grass in Sweden. Farmers will mix different cuts to get more even quality over the season for the dairy cows. Whole crop silage will be around 10-15 % for the milking cows, mainly as a fiber source.

We do not have separate statistics for the quality of organic roughage. The quality for the most common clover/grass silage is presented in the table below. It is silage with less than 50 % clover (number 165, Norfor, Växa)

Cutting number	Organic Matter Digestibility	Crude protein	NDF	Nel ₂₀	ME
(number analysis)	(%)	g/kg DM	g/kg DM	MJ/kg DM	MJ/kg DM
1 (2287)	76,2	137	462	6,13	11,0
2 (1551)	72,6	145	466	5,77	10,4
3 (488)	74,0	155	432	5,84	10,5
4 (78)	75,7	177	413	6,03	10,9

11) Typical clover/grass mixture on an organic dairy farm (for cutting)

A clover/grass mixture in Sweden will consist of red and white clover; timothy, meadow-fescue; perennial rye grass (only in the south). Meadow fescue is exchanged with Tall Fescue (rörsvingel, Festuca arundinacea Schreb) or hybrids of Tall Fescue (rörsvingelhybrider) in many mixture now.

A typical mixture in Sweden will be:

- Red clover: 10 – 15 %
- White clover: 5 – 10 %
- Timothy: 30 – 65 %
- Meadow fescue/Tall fescue(hybrid) 15 – 40 %
- Perennial rye grass 0 – 25 % (left out more and more)

Luzern in combination with Tall Fescue is getting more and more popular in the southern part of Sweden. 15 – 20 % is added to the mixture and the “grass part” is lowered, mainly timothy.

12) Average roughage percentage in the feed ration for the whole lactation (estimate)

A qualified estimate is 65 % (plus/minus) 5%

13) Typical composition of concentrate mixture, (bas mixture, top mixture)

Raw materials in concentrate:

Cereal part: Barley, oats, wheat, triticale

Protein part: Soya, rape seed, field beans

14) Health data: % Dead cows; % dead calves (1-180 days); Cell number; Longevity cows

Some health data is presented in the table below from milk recording data (Växa, 2015).

	Organic	Conventional
Age of cows leaving (month)	60,9	60,2
Somatic cells (1000)	269	247
Dead born calves (%)	5,4	5,5
Out sorted cows, all (%)	35,7	38,2
Out sorted first calfers (%)	24	26,3

15) What do you experience is the biggest challenge for organic milk production in your country?

The biggest challenge is to keep a good demand in the market for organic milk. On farm level, farm layout of fields for grazing is a challenge as herd size increase. It is even important to get a more positive view on grazing – really see grazing as a potential for the cows and for the economy. Self-sufficiency nationally and regionally with protein feeds is a challenge. At the moment organic dairy production still rely on imports of organic soya which can be questioned in relation to the ideas of near produced feeds for organic animals.

16) Important websites for information concerning organic dairy production

Växa: <http://www.vxa.se/>

Jordbruksverket: www.jordbruksverket.se/eko

LRF mjölk: <http://www.lrf.se/om-lrf/organisation/branschavdelningar/lrf-mjolk/>

KRAV: <http://www.krav.se/>

Ekologiska lantbrukarna: <http://ekolantbruk.se/>