

International Farm Comparative Report, 2022.

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1. Background to the IFCN

The International Farm Comparison Network (IFCN) virtual conference was attended by the Project Manager as part of the Milk SA project: Economies and Markets. The specific aim of participating and attending the conference is to gauge the international competitiveness of the SA primary dairy industry. The IFCN is a knowledge-driven organization. Knowledge is created via a network of dairy researchers from 54 countries. The data is managed and analysed by the IFCN Dairy Research Centre staff based in Kiel, Germany. The IFCN economic models and standardization ensure comparability between countries and provide a global picture. More than 140 dairy companies and organisations support and make use of the IFCN.

The values of the IFCN are Trust, Independence and Truth. Trust within the IFCN network is vital for sharing and cooperation. The IFCN is independent and committed to the truth.

In the 2022 Dairy Report of the IFCN, 172 farms in 66 dairy regions in 54 countries took part. They represent 91% of the total world dairy production.

2. Methodology of research

The IFCN applies the Typical Farm Approach (TFA) as a base for standardized global data collection. This approach represents the most common farm type which, at the same time, also produces a large portion of the total milk in the region. This makes it possible to obtain a comprehensive overview in order to generate information at the farm level. The majority of the analyses are based on the information of 132 typical farms, one averaged sized and one large typical farm, for every region/country.

Most of the monetary results are presented in USD in order to be able to compare farm information. Therefore, the average exchange rate of each country was used. It is important to note that the exchange rate and inflation rate affect the information provided.

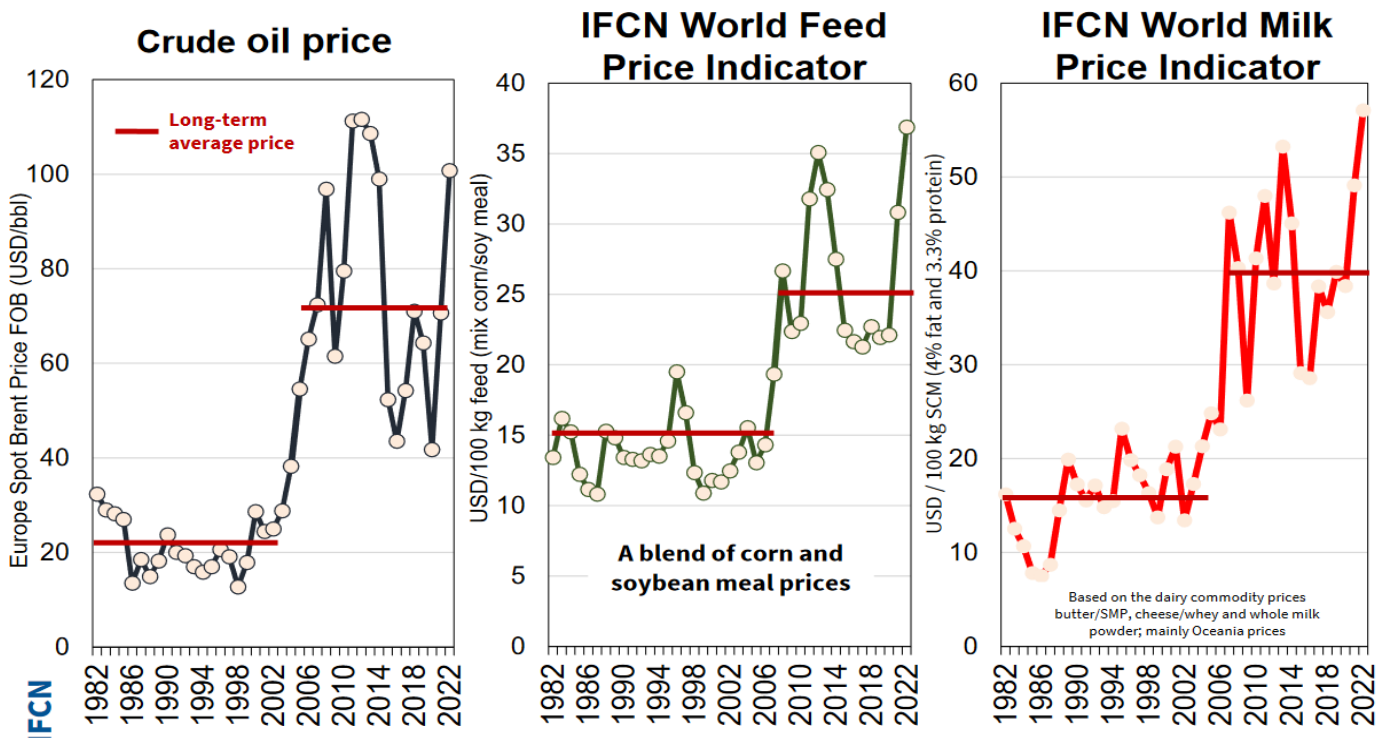
All unprocessed milk is converted into solid corrected milk (SCM). Unprocessed milk output with 4.0% fat and 3.3% true protein is generated. The factor used to express the density of unprocessed milk is 1.033 per litre.

3. Unprocessed milk prices and drivers

The IFCN world unprocessed milk price stood at an average level of 45.1 USD/100kg SCM corrected milk in 2021, which is an increase of 23% over the previous year. In 2022 the price increased by 18.4% to 53.4 USD/100kg SCM corrected. The primary cause for the stiff unprocessed milk price increase was the supply shortage among the top exporting countries. The supply shortage was a result of the increased cost of production experienced throughout the dairy value chain, starting at primary supply. The high cost of feed, fertilizer, and energy prices as well as the outbreak of the war

in Ukraine. Due to these factors, the unprocessed milk price reached a record level of 63.3 USD/100kg SCM corrected in April 2022. In 2023 the price dropped by 25.4% to 39.8 USD/100kg SCM corrected milk. The decreasing trend in 2023 was due to unprocessed milk production recovery and higher commodity availability that harmed the unprocessed milk price. On the demand side, the trend was due to weakened consumption because of inflationary pressure and economic anxiety.

Global trends in oil, feed and milk prices



Source: IFCN, Dairy Report 2023

The **trend in the world’s unprocessed milk price** from 1996 to 2023 is reflected in the graph below. The volatility in the period from 1996 to the middle of 2016 is noteworthy higher than the period thereafter inclusive of the first six months of 2021. The latter part of 2021, through 2022 and 2023 saw increased volatility.

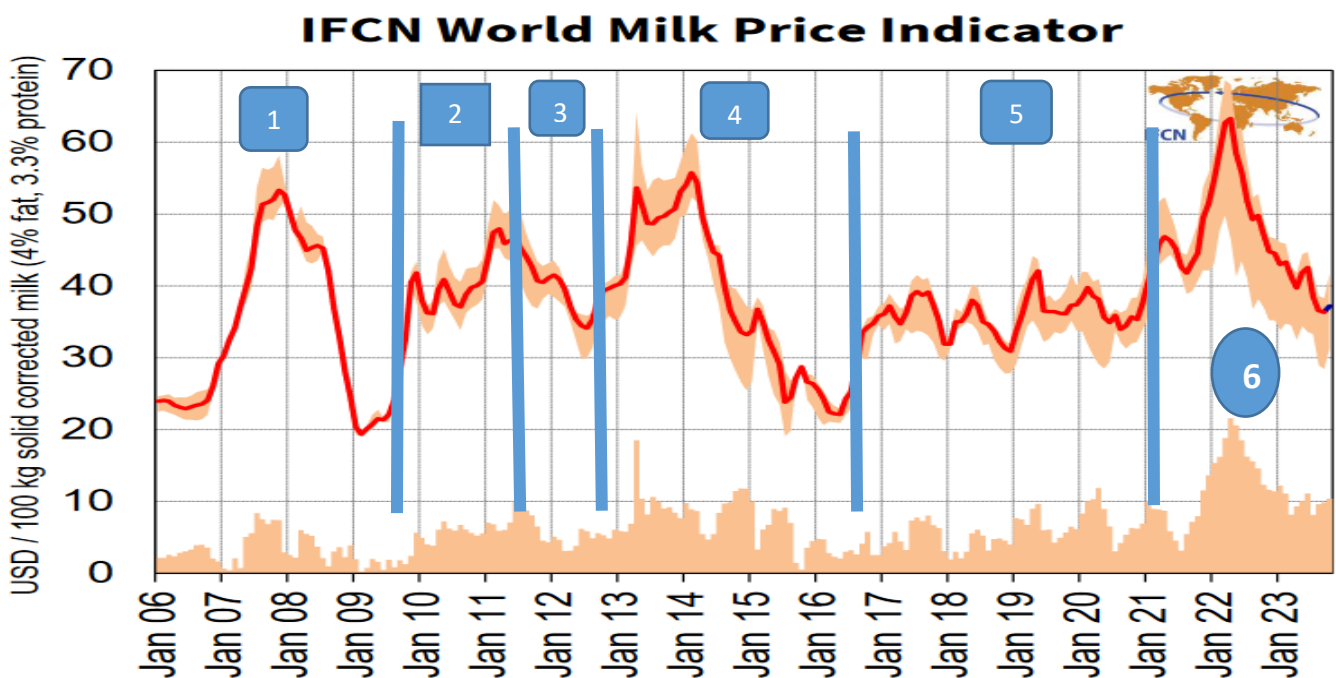
Cycles in the unprocessed milk price are simplified into the following timeframes:

- 1st Rollercoaster: 2007 – 2009, length 3 years, fluctuation 50%, indicating an imbalance. The beginning of this cycle was driven by increased demand with supply responding slowly. At the same time oil and feed prices rose to new levels, contributing to the peak price of 53.3 USD/100kg SCM in November 2007.
- 1st Zig-Zag: 2010/11, length 12 months, fluctuation 10%, indicating balance. This phase of stability was induced by high stock dairy levels which existed at the end of 2009.
- 1st Dynamic wave: 2011 -2012, length 2 years, fluctuation 20%, indicating balance. Milk supply and demand were growing at a similar rate. However, adverse weather events, such as the drought in North America caused feed prices to outstrip the milk

price. This resulted in poor farm economics that lead to reduced supply at the end of 2012 and triggered a new rollercoaster phase at the beginning of 2013.

4. 2nd Rollercoaster: 2013 – 2016, length 4 years, fluctuation 50%, indicating an imbalance. During this phase, the peak price was 55.8 USD/100kg SCM and the lowest price was slashed to 27.1 USD/100kg SCM. The main causes of the high volatility were the high prices at the beginning of the phase, leading to production stimulation, the abolition of the European milk quota system and the ban of European exports to Russia.
5. 1st Extended Zig-Zag: 2017 - 2020, length in play, fluctuation 10%, indicating balance. In 2017 a new scenario started to present, which can be classified as an extended Zig-Zag phase.
6. 3rd Rollercoaster: 2021 - ? Considering 2021, 2022 and 2023, it seems that a rollercoaster phase is developing for the global dairy market. During 2021, the world milk price went from 40.5 USD/100kg SCM in January 2021 to 51.3 USD/100kg SCM in December 2021. The upward trend continued into the first quarter of 2022 but started to reverse thereafter. At the start of 2023, there was a short uptick in the price but then the downward trend continued. Right at the end of 2023, another uptick in the price is projected.

These cycles are demonstrated in the graph below:

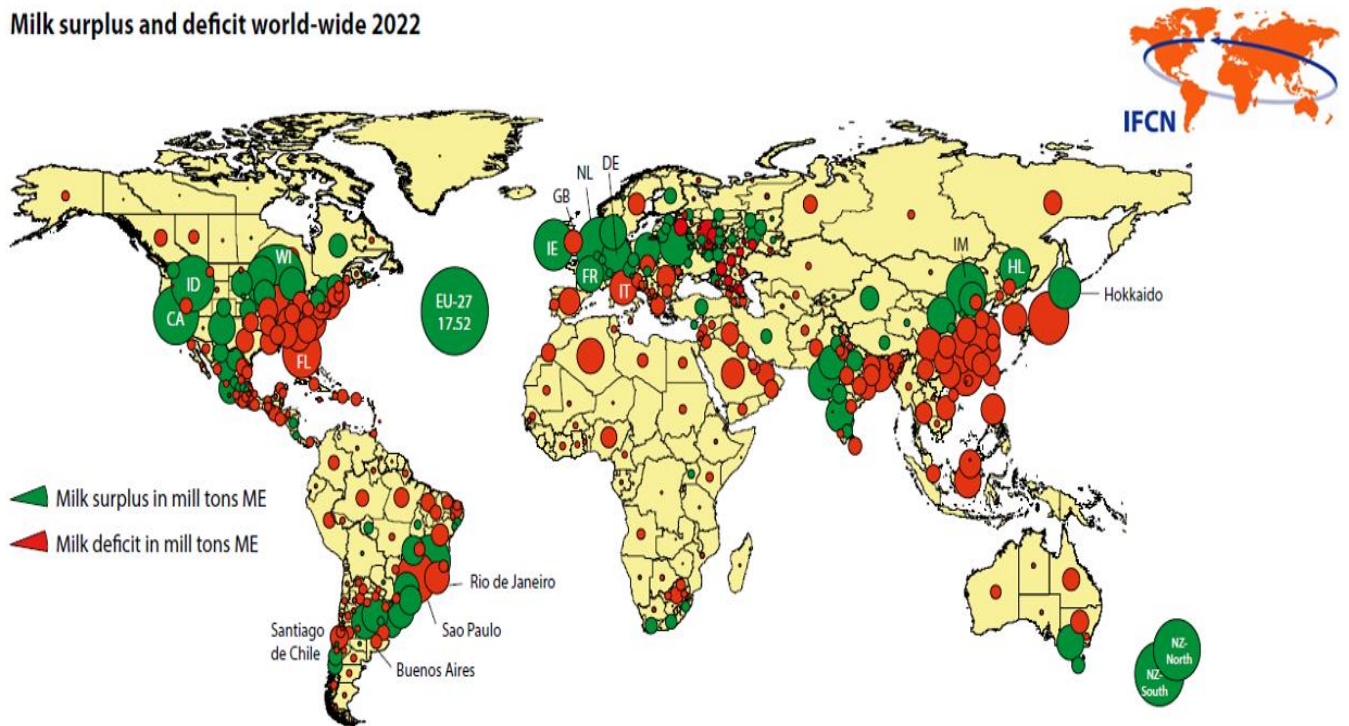


(Source: IFCN, Dairy Report 2023.)

4. World unprocessed milk production in 2021 is illustrated in the map below and surplus and deficit situations in the next map

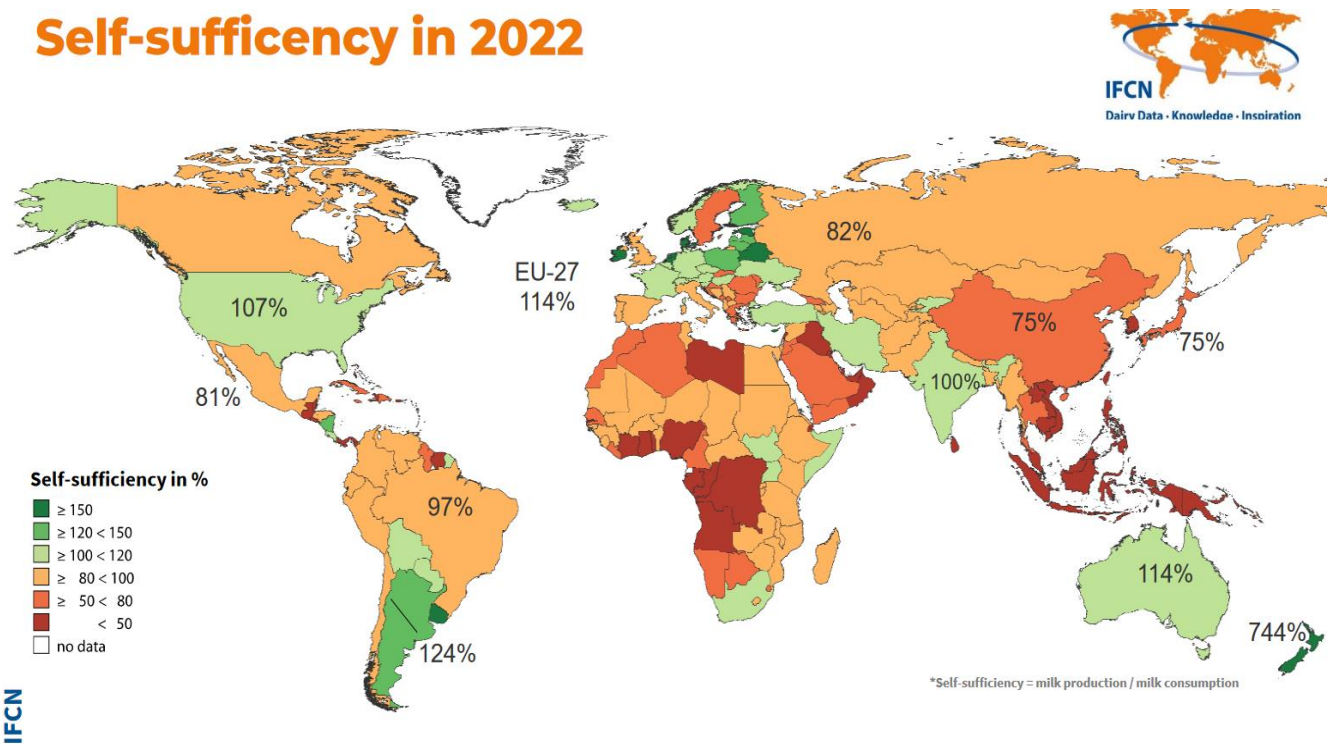
The map below reflects the absolute levels of unprocessed milk production in the world during 2022 and the share of milk delivered. (Source: The following 2 maps, IFCN, Dairy Report 2023.)

Milk surplus and deficit world-wide 2022



The concentration of surplus versus deficit production of unprocessed milk is visible in different parts of the world and even more evident in certain countries.

Self-sufficiency in 2022



Self-sufficiency in the above graph is defined as self-sufficiency = unprocessed milk production/consumption, and where consumption = production – exports + imports +- changes in stocks. In the graph, New Zealand exceeds self-sufficiency the most, followed by Argentina while China and Japan are the most dependent countries.

5. Country comparison: the average size of dairy herds

The global average dairy farmer owns 2 to 3 dairy cows. Larger herds are found in Saudi Arabia, South Africa, New Zealand, the United States of America and a few other countries. South Africa’s average dairy herd size is one of the largest in the world. Table 1 reflects the average dairy herd size of a few selected countries. The pecking order remained the same as per the previous year.

Table 1. The average number of cows in the dairy herd, selected countries; 2022

Country	The average number of cows in the herd
Saudi Arabia	6 433
South Africa	574
New Zealand	448
USA	336
Australia	305
Czech Republic	259
Denmark	232
Israel	209
United Kingdom	162
Argentina	151
Uruguay	125
Nederland	105
Ireland	106
France	71
Poland	12
India (cows and buffalos)	2

Source: IFCN, Dairy Report 2023

6. Country comparison: number of dairy farms

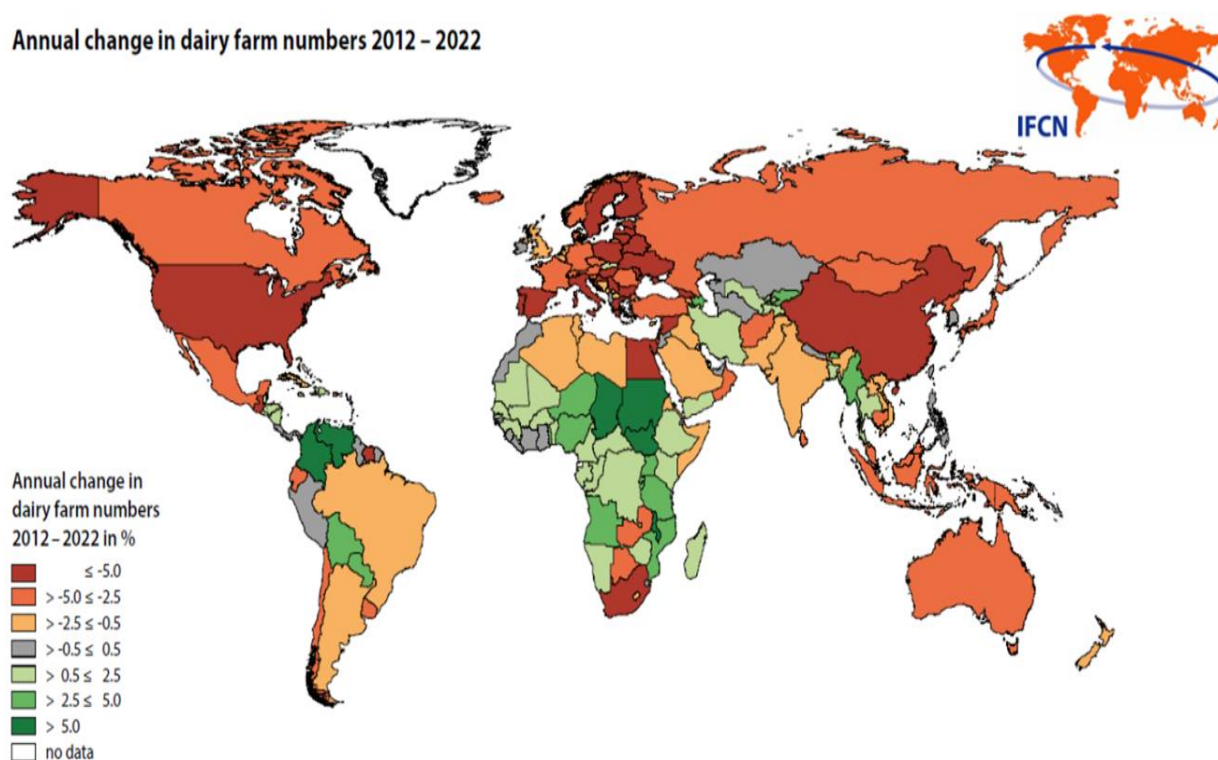
The number of dairy farms differs hugely between countries. There is some correlation between the average number of cows per herd and the number of farms. The smaller cow numbers per herd tend to be associated with large farm numbers. Table two reflects the number of farms for a few selected countries.

Table 2. The average number of dairy farms for selected countries, 2022

Country	The average number of farms
Saudi Arabia	30
South Africa	1 080
New Zealand	10 800
Australia	4 400
USA	27 900
Czech Republic	1 380
Denmark	2 400
Israel	660
Argentina	10 100
United Kingdom	11 400
Uruguay	3 100
Netherlands	15 000
Ireland	15 300
France	45 700
Poland	174 900
India	67 320 000

Source: IFCN, Dairy Report 2023

Annual change in dairy farm numbers 2012 – 2022



Data: Dairy farm numbers (cow, buffalo). If no data were available for 2012, the number of dairy farms for 2013 was taken (Russian Federation)

Source of data: National statistics and estimations.

Calculation: $((\text{Dairy farm number in 2022} / \text{Dairy farm number in 2012})^{10} - 1)$

Source: IFCN, Dairy Report 2023

In the above map, most of the country colour indicators reflect a decline in dairy farm numbers. In the above map, the following countries experienced the most decline in dairy farm numbers: Alaska, USA, Britain, most countries in the EU, Egypt and China. On the other side of the spectrum, countries where dairy farm numbers increased the most were Colombia, Venezuela, Chad, and North and South Sudan.

7. Farm comparison: cost of unprocessed milk production

The cost of the production of unprocessed milk is a key indicator of the competitiveness of unprocessed milk production in a region/country compared to that of other regions/countries. In addition, a comparison to the farm gate price of unprocessed milk provides information on the farm's profitability.

In the cost of unprocessed milk production analysis, it was found that 7% of the farms had a cost of unprocessed milk production of ≤ 30 USD per 100kg SCM and are typically situated in Africa, South America and Oceania. This percentage decreased from 20% in 2020 to 15% in 2021 and 7% in 2022. The middle group consists of 73% of the farms with a cost of unprocessed milk production between 30 USD and 60 USD per 100kg SCM and includes Europe, North America and Asia. This percentage decreased from 72% in 2020 to 68% in 2021 and to 73% in 2022. The high-cost producers (20%), ≥ 60 USD per 100kg SCM, are found in the Alpine region, Canada, Israel and some farms in Asia. This percentage increased from 8% in 2020 to 17% in 2021 and 20% in 2022. The shift away from low-cost producers could be a result of the drastic upswing in a range of farm input costs in 2021 while this phenomenon got amplified in 2022.

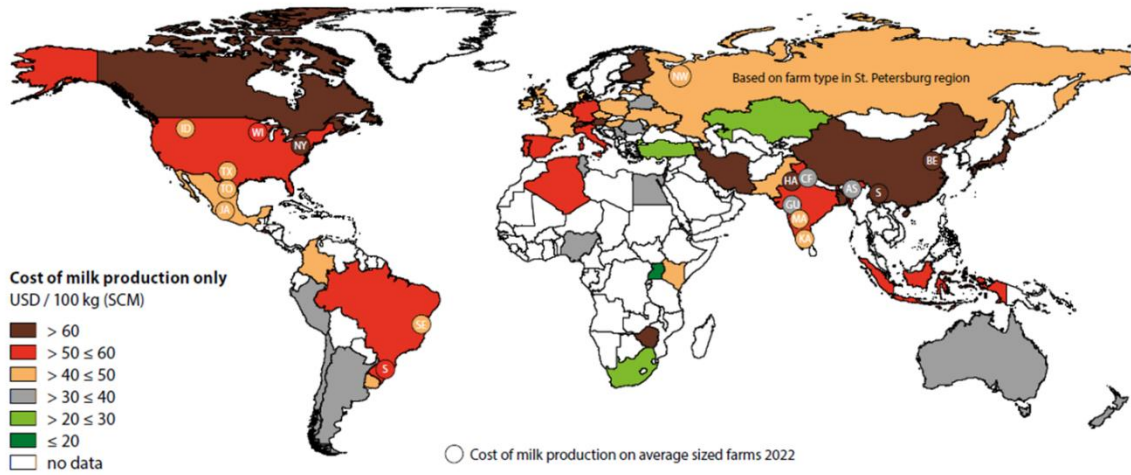
The average cost of unprocessed milk production per 100kg SCM ranges between 13 USD in Uganda and 207 USD in Switzerland. The extremely low-cost producers are found in countries where the feed cost is near zero, the owner's opportunity cost of labour is low and where a small percentage of the unprocessed milk produced is sold in the market.

In the IFCN typical farm comparison analysis, South Africa included three farms. A small farm with 230 cows on grazing plus concentrate, an average farm with 650 cows (ZA-650) on grazing and an 800 cows (ZA-800) farm on intensive total mixed rations were included.

The costs were grouped into seven categories: variable feed costs, total labour, land and capital, depreciation of machinery and buildings, veterinary, medicine, insemination and other costs.

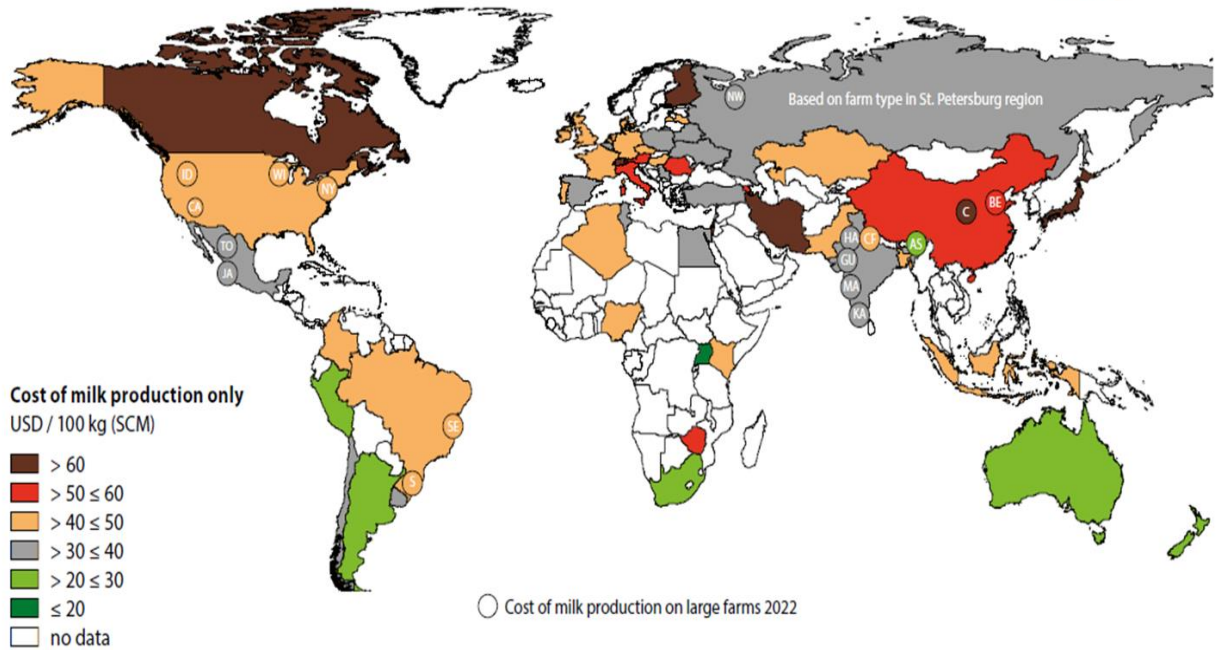
The first map below reflects the cost of unprocessed milk production on average-sized milk farms for 2022 and the second map on large farms for 2022 (USD/100kg, SCM). South Africa rates amongst the lowest-cost producers in the world ($>20 \leq 30$ USD/100kg SCM).

Cost of milk production on average sized farms 2022



Indicator: Cost of milk production (excluding quota cost) of the "average sized" typical farms analysed.

Cost of milk production on large farms 2022

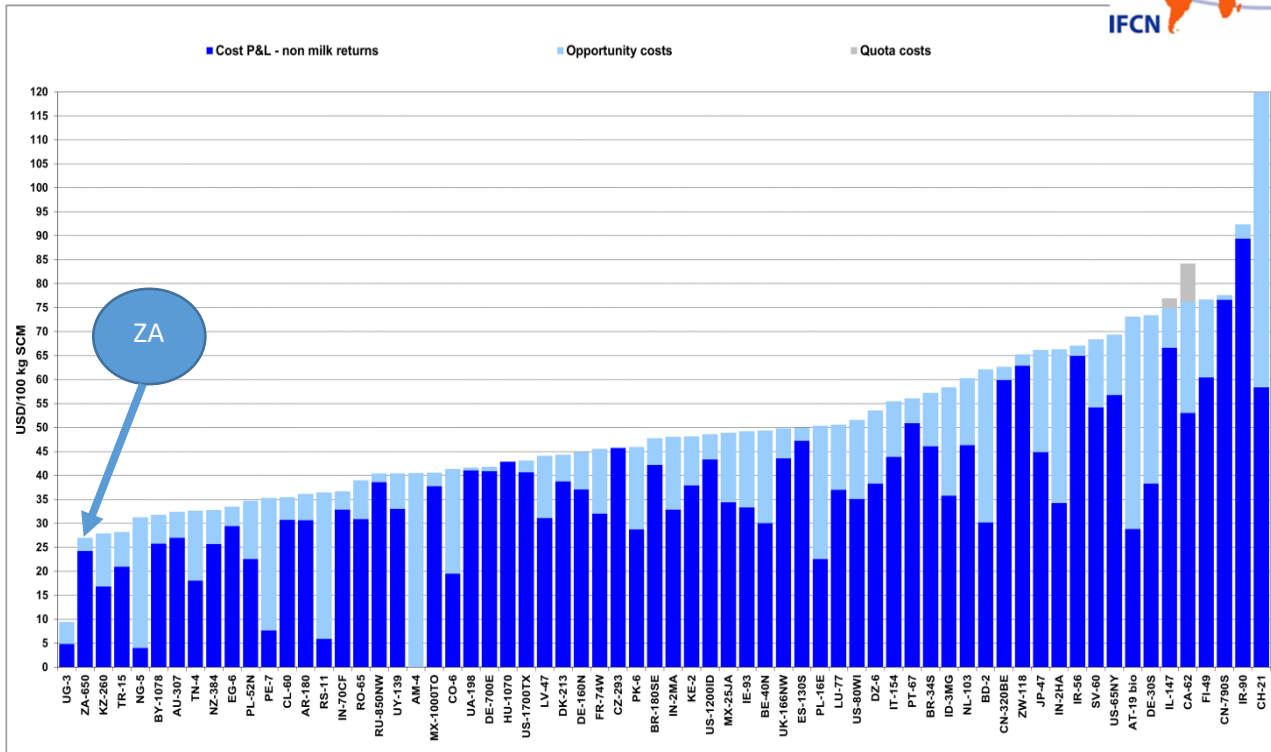


Indicator: Cost of milk production (excluding quota cost) of the large typical farms analysed.

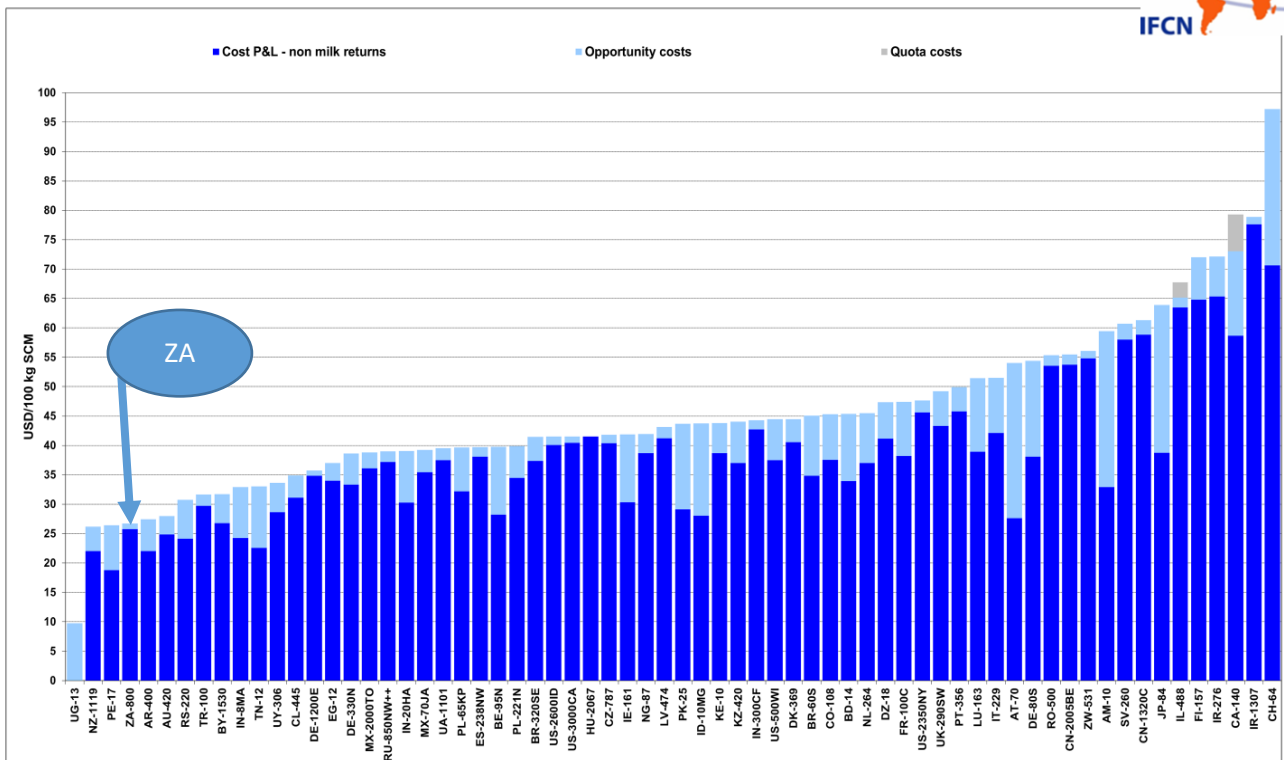
Source: IFCN, Dairy Reports, 2023.

The graphs below show the cost of unprocessed milk production on average and large-sized farms between different countries (Source: IFCN, Dairy Report 2023).

Cost of milk production only on averaged sized farms



Cost of milk production only on large farms

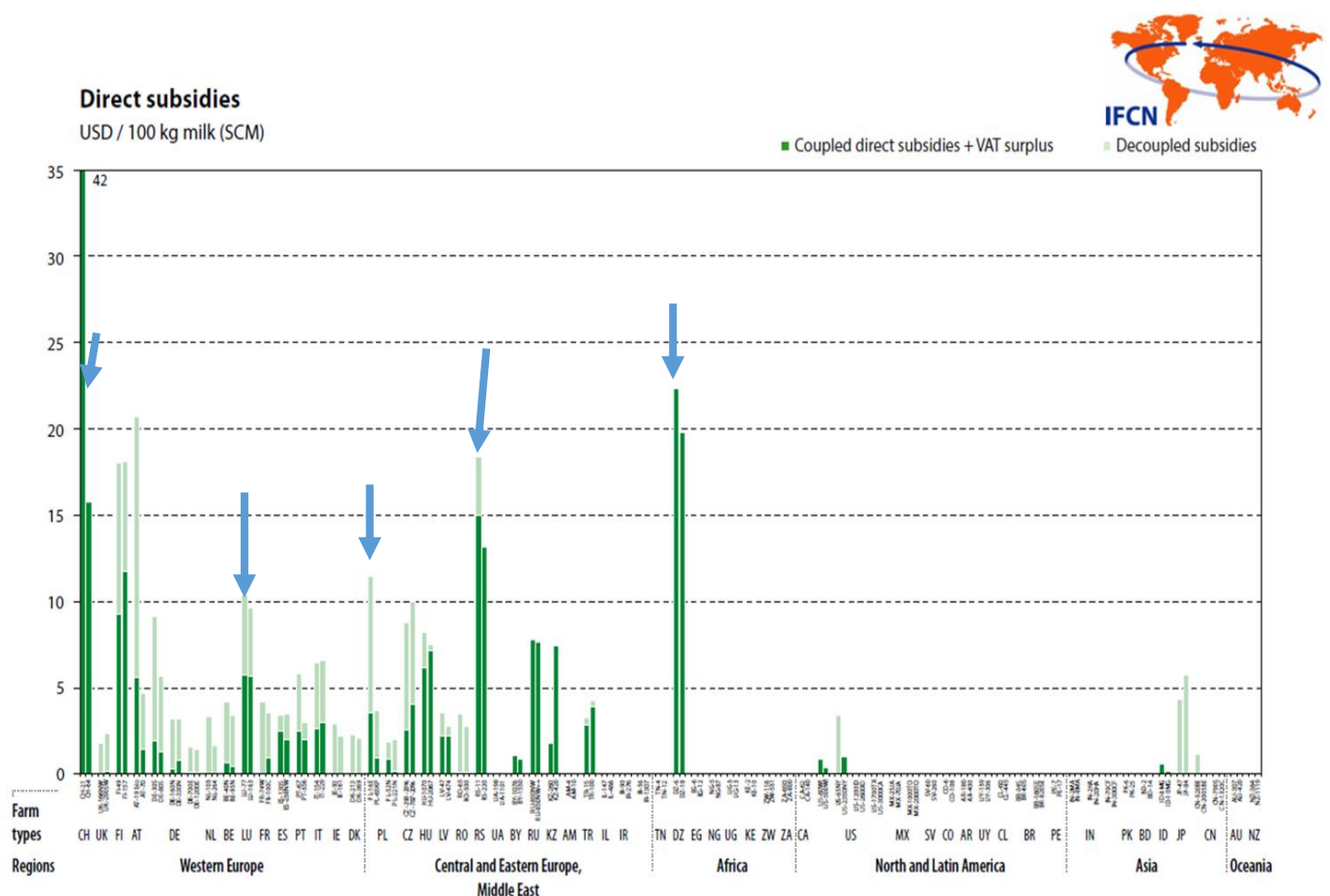


For the average-sized farm (ZA 650), South Africa is number 2 of low-cost producers out of 66 farms and for the larger-sized farm (ZA 800), SA is number 4 of low-cost producers out of 66 farms. We need to note that for average-sized farms, the first 4 (2021 there were 9) lowest-cost farms fall into the category of the cost lower than 30 USD/100kg SCM and for the large-sized farms, the first 6 (2021 there were 12) lowest-cost farms fall into the category of the cost lower than 30USD/100kg SCM.

8. Direct subsidies and policies (USD/100kg SCM)

The cash income of dairy farmers in the EU and some other regions of the world is strongly influenced by different types of subsidies and payments. The subsidy policies and implementation in countries and regions are complex. All subsidies which are directly linked to the process of producing milk, are considered coupled subsidies. Decoupled subsidies are transfers to farmers as direct aid, often based on the amount of land farmed and not directly linked to production. Decoupled subsidies exist in the EU, Japan and to a minor degree in Serbia, the USA and Chile

The blue arrows in the graph below, from left to right, are for the countries Switzerland, Luxembourg, Poland, Serbia, and Algeria. The country codes on the X-axis are unclear. If you need more information, please contact the report writer on 083 300 3667. The supply of subsidy information absorbed in this report is voluntary.



9. Conclusion

The increasing trend in the IFCN average world unprocessed milk price started to reverse in 2023 decreasing by 25.4% from 53.4 USD/100kg SCM in 2022 to 39.8 USD/100kg SCM in 2023. The IFCN viewpoint is that 40 USD/100kg SCM will be a stable world average unprocessed milk price for 2024 (caveat no further major shocks).

In terms of dairy production and consumption, New Zealand exceeds self-sufficiency the most, followed by Argentina while China and Japan are the most dairy-dependent countries in terms of self-sufficiency.

South Africa has the second largest average number of cows in a dairy herd according to the IFCN study.

In most countries in the world, the number of dairy farms is declining. The following countries experienced the most decline in dairy farm numbers: Alaska, the USA, Britain, most countries in the EU, Egypt, and China. On the other side of the spectrum, countries where dairy farm numbers increased the most were Colombia, Venezuela, Chad, and North and South Sudan. The general trend in worldwide primary dairy production indicates continued and increased consolidation.

There is a noteworthy reduction in the number of low-cost producers which could be a result of the drastic upswing in a range of farm input costs in 2021 while this phenomenon got amplified in 2022. The number of low-cost producers ($>20 \leq 30$ USD/100kg SCM) reduced in 2022 from 15% of the farms in 2021 to 7%. South Africa rates amongst the lowest-cost producers in the world ($>20 \leq 30$ USD/100kg SCM).