

Milk Essay

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Tel 012 460 7312 • www.milk.co.za

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This is a publication of Milk SA. Milk SA was founded by the primary and secondary dairy industry sectors to promote a healthy South African dairy industry.

MILK SA WELCOMES TWO NEW DIRECTORS ON BOARD



Colin Wellbeloved, who previously served as Alternate Director for MPO nominated Directors, was appointed as Standing Director to the Milk SA Board of Directors on 1 November 2019. He is also Chairman of the Milk Producers' Organisation.



Neels Neethling, Vice Chairman of MPO North, was appointed as Alternate Director for MPO nominated Directors on 27 November 2019.

Ecology of *Listeria spp.* and *Listeria monocytogenes*

Significance in Dairy Production

The abstract below is from Bulletin 502 of 2019 of the International Dairy Federation:

Listeria monocytogenes show the highest versatility in foodborne disease outbreaks and are associated with a wide variety of foods. Recent outbreaks in deli meats in South Africa, frozen vegetables in Europe and ice cream in the USA have all linked contamination of the final product to the food-processing environment. Within the dairy context, historical control measures

through heat (pasteurisation) have had a major impact on reducing the occurrence of listeriosis, but contamination of processed dairy foods still occurs. More understanding of ecological niches within dairy farming plants, in order to minimize the likelihood of recontamination events after critical control points, is still needed. The present review aims to summarise the different relevant actions in the food production process that need to be implemented to minimize the likelihood of unsafe final dairy product production in terms of *L. monocytogenes*."





RESEARCH & DEVELOPMENT

Ethical consumerism and sustainable production

Ethical consumerism is a new concept used to describe the increasing interest of the consumer in the way food is produced, the practices employed, a concern for a low environmental impact, high animal welfare and optimal worker conditions. As a consequence, popular perceptions of sustainable agriculture appear to favour traditional systems, organic production, or that farms should only supply the local geographical area. Although most understand that improving efficiency will reduce expenses, resources and waste, the consumer often considers efficiency to be negatively related to ethical consumerism when applied to large-scale conventional food production systems. The question is if this perception is justified.

In a classical study in the US, 1944 dairy production was compared with 2007 dairy production. In 1944, 53 billion kg of milk was produced from 25.6 million dairy cattle. At the time the average herd contained 6 cows which were almost exclusively fed on pasture. Artificial insemination was in its infancy and antibiotics or effective drugs were limited or not yet available for animal use. By contrast, in 2007 the US dairy herd contained 9.2 million cows producing 84.2 billion kg of milk.

Improvements in management, nutrition and genetics led to a four-fold increase in milk yield per cow between 1944 and 2007. The effect on resources, environment, waste and land-use was dramatic since together with the reduction in lactating animals, the supporting herd (dry cows, bulls, replacement heifers etc) was of course also

reduced. Thus, compared to 1944, the 2007 US dairy industry required only 21% of the dairy population, 23% of the feedstuffs, 10% of the land and 35% of the water to produce a set quantity of milk. Manure output per unit of milk produced in 2007 was 24% of that of 1944, the carbon footprint per unit of milk was reduced by 63%, or if expressed as total carbon footprint of the US dairy industry, reduced by 41%.

These results are not unique to the US and estimates show that there is a highly significant negative relationship between level of milk production and the carbon footprint per unit of milk. Countries with higher milk yields per cow most often use conventional TMR and supplemented pasture-based systems, whereas countries with low milk yields per cow more often use traditional and organic systems. The 2007

figures for the different regions of the world were:

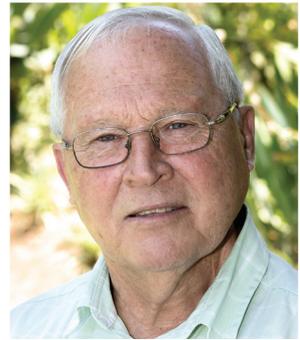
Country	Milk yield (kg) per cow per lactation (2007)	Corresponding carbon footprint expressed as kg CO ₂ (carbon dioxide) equivalent per kg of milk (2007)
North America	8 800	1.3
Western Europe	6 100	1.5
Oceania	4 400	1.6
Eastern Europe	3 900	1.6
Russian Federation	3 000	1.7
South-East and east Asia	2 800	2.1
Central and South America	1 700	3.3
Near East and North America	1 300	3.7
South Asia	1 000	4.7
Sub-Saharan Africa (Excluding South Africa)	250	7.6

To arrive at a possible figure for commercial herds in South Africa, the national average production in 2007 (to correspond with the figures above) was 4590kg and for cows in milk recording 6948kg, a difference of 51%.

In the context of the above regional milk yields and carbon footprints, the South African national LCA carbon footprint could be 1.6 kg CO₂ equivalent per kg milk and for milk recorded cows 1.4kg CO₂ equivalent per kg milk. It is interesting that another calculation for South African commercial herds, based on a different approach, came up with a figure of 1.3 to 1.5 kg CO₂ equivalent per kg milk. However, LCA's for dairy production systems in different regions of South Africa have as yet not been researched officially and should be done as a matter of urgency in order to advise on mitigation options.

Dr Heinz Meissner, Milk SA's R & D Programme Manager, writes a monthly article for the "Research Column". The complete article and references are available on <https://milksa.co.za/research/research-column/ethical-consumerism-and-sustainable-production>

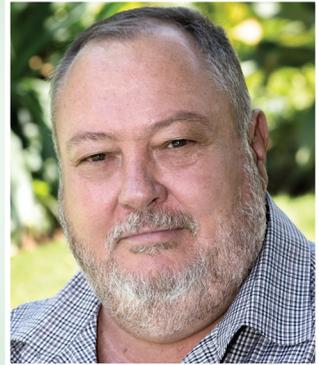
What is to be learned from this research? Firstly, it is a misconception on the part of the consumer that traditional or organic systems are more environment-friendly than conventional systems, bearing in mind that food production needs to increase to feed the ever increasing world population. Additionally, it is a misconception that organic systems can achieve the same levels of production as conventional systems. Secondly, efficiency of production which correlates with level of production is key to limit the environmental and climate change impact as the same amount of milk (or more) can be produced with fewer cows. Thirdly, ethical consumerism is not only about limiting environmental impact and resource use, but also about practices employed, animal welfare and optimal working conditions.



CUSTOMS DUTY AND MARKET ACCESS PROJECT

At Milk SA's General Meeting on 27 November 2019, De Wet Jonker, Project Manager of Milk SA's Customs Duty and Market Access Project, said the African Continental Free Trade Agreement (AFCFTA) which includes 54 African countries, had eventually been finalized and was expected to come into effect on 1 July 2020.

Referring to the increase in the volume of UHT milk which had been imported from Poland in the last few years and protection against the import of UHT milk, De Wet said that Article 35 of the EPA (Economic Partnership) Agreement provided that if a certain trigger level were exceeded, a safeguard duty could be applied for. He said this had been promulgated and gazetted in October 2019.



Customs Duty and Market Access Project Manager, De Wet Jonker.

CONSUMER EDUCATION

RediscoverDairy now on Facebook

The RediscoverDAIRY Facebook page aims to remind the Modern Mom of the amazing benefits of dairy; share quick and delicious recipe ideas; and provide evidence-based nutritional facts about milk and other dairy products.

Young or old, dairy gives our bodies not only enough energy for the day, but also the nutrients to function at our best.

Visit the RediscoverdairyDAIRY Facebook Page and share the information with your community.



Consumer Education Project Coordinator, Christine Leighton.



http://www.facebook.com/RediscoverDAIRY/?epa=SEARCH_Box

IDF – Forthcoming events

Registration is open for **IDF 8th IDF International Symposium on sheep, goat and other non-cow's milk** to be held on 4-5 May 2020 in Brussels.

The symposium will cover the latest scientific advances on milk originating from other ruminants than cows and will provide information on human nutrition and science and technology, as well as advances on animal health.



The **IDF International Symposium on Cheese Science and technology 2020** will be held on 1-5 June 2020 in Quebec City. The packed programme will include cheese microbial ecology, along with the latest insights into cheese technology and innovation and a consumer-centric approach to research. Sessions will be complemented by an artisan cheesemaker workshop, the FIL-IDF Canada Dairy Outlook Seminar and visits to centres and cheese factories.

Snippets from The World Dairy Situation 2019

- Cow's milk production represents 81,5% of total milk production. It grew by 2,1% to 704 million tonnes in 2018 - similar to the growth experienced in 2017.
- Cow's milk deliveries to the industry increased by 1.3% from 2017 to 2018, a noticeable slowdown from the eight year average of 1,7%.
- The EU processes the largest quantity of milk, followed by the United States, China, Brazil, New Zealand and Russia, with India not ranked.
- Growth in the production of packaged milk (liquid milk) was zero from 2017 to 2018, while the production of fermented dairy products increased by 2,1%.
- Global cheese production increased by 2,1% to 21,3 tonnes, in line with the 2,2% average increase over the last 10 years.
- Butter and other milk fat production increased by 2,5%, slightly down from the 10 year average of 2,9%. Full-cream and semi-skimmed milk powder increased by 0,4%, while skimmed milk powder production decreased by 0,7%.
- Global production of condensed and evaporated milk has been on a downward trend for the last three years, with production from 2017 to 2018 decreasing by 2,2%.

The World Dairy Situation report was published in September 2019. The complete report is available from IDF at www.fil.idf.org

IDF: COP25 Talking Points relating to dairy emissions

- The dairy sector has one of the smallest carbon footprints per unit of animal product in the world. Producing milk and indirectly meat, accounts for 4% of all global greenhouse gas (GHG) emissions from human activities.
- Overall contributions of milk production, processing and transportation represent 2.7% of GHG global emissions.
- Methane, the main component of ruminant emissions, is a slow, short-lived climate pollutant (10 years versus 1000 years for CO₂). In contrast to CO₂, methane from ruminants does not accumulate in the atmosphere and produces no new warming, provided that herd sizes do not increase.
- In some situations, well-managed ruminants are even able to sequester carbon in the soil, thereby also improving soil health.
- The improvement of fertility rates, animal health, genetics and feeding are part of the solution to tackle high GHG emission levels per unit of animal source food.
- Globally, livestock causes 14.5% of the total GHG emissions but there are vast regional differences due to different agroecological conditions, farming practices and supply chain management.
- A change to plant-based diets would translate on a minimum reduction of greenhouse emissions globally. For example, if animal agriculture were eliminated in the US, greenhouse gas emissions could be reduced by 2.6% in the US, and 0,36% globally. This reduction would result in a trade-off in nutritional outcomes and create an unbalanced food ecosystem.

Trends in international production of unprocessed milk, dairy consumption and product prices

Extract from Dr Koos Coetzee's report on the 2019 World Dairy Summit

World production and consumption trends

According to the 2019 World Dairy Situation Report of the IDF, global milk production grew by an average of 2,2% from 2010 to 2018 and is expected to grow by 2,5% to 864 million tonnes in 2018 and by a lower 1,8% to 2019.

Furthermore, per capita consumption increased from 112,2 kg per person per year to 113,7 kg/p.c. in 2018. Both per capita consumption and population growth drive demand growth. Forty-seven percent of total milk production is used in the informal market, 16% as fresh milk and fresh milk products, 14% as cheese, 4% full-cream milk powder, 3% skimmed milk powder, and 1% others.



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Sugar-sweetened milk and dairy products

On her return from the 2019 WDS in Istanbul, Maretha Vermaak, dietician for the Consumer Education Project and member of the IDF Standing Committee on Nutrition and Health (SCNH), reported as follows:

- Governments around the world are putting in place policy and regulatory measures to address non-communicable diseases, which have the potential to limit consumption of dairy foods and beverages, especially sweetened / flavoured dairy, which could in turn reduce intake of essential nutrients from dairy. Such proposed measures include taxes, labelling, marketing and sales restrictions, as well as changes to dietary guidelines.
- In 2016, global statistics showed that more than 1.9 billion adults aged 18 years and older were overweight, of whom over 650 million were obese. Excessive consumption of sugar is a factor known to promote obesity. In 2015, WHO issued a guideline recommending a restriction in intake of “free sugars” to less than 10% of daily energy intake, also suggesting that a further reduction to below 5% of daily energy would provide additional health benefits. This equates to approximately six teaspoons of sugar (30g).
- The guideline defines “free sugars” as monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook or consumer; and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates. Sugars naturally present in fresh fruit and vegetables as well as milk are excluded, as there is no reported evidence of adverse effects of consuming these sugars.
- WHO has encouraged countries worldwide to translate these recommendations into food-based dietary guidelines that consider locally available food and customs. In addition, some countries are implementing public health interventions to reduce the intake of free sugars.
- Unfortunately in South Africa, government’s initiative to reduce the intake of free sugars, ignores to a large extent the difference between free sugars and the sugar (lactose) which occurs naturally in milk and other dairy products.

Trends in international production of unprocessed milk, dairy consumption and product prices (Cont.)

The report also states that dairy consumption was expected to grow by 1,7% per year from 2015 to 2028, with slower growth (0,8% CAGR) in developed and faster growth (2,3% CAGR) in developing countries. The European Union (28%), New Zealand (25%), USA (15%), Australia and Belarus (5% each), Argentina (2%) and Uruguay (2%) are the major dairy exporting countries.

Dairy product prices

The Agricultural Outlook 2019 - 2028 of the Organisation for Economic Co-operation and Development (OECD) forecasted that dairy product prices would remain positive for the next decade. The gap between milk fat and other solid prices will probably continue. FAO-OECD projections are more positive for cheese and butter than in their 2018 forecast.

COMPETITIVENESS OF THE SA PRIMARY DAIRY INDUSTRY SECTOR

Highlights from a report by Bertus van Heerden

The International Farm Comparison Network (IFCN) conference was attended by Bertus van Heerden, who is the Manager of the Milk SA project: Economies and Markets. The specific aim of participating and attending the conference is to gauge the competitiveness of the SA primary dairy industry. Knowledge is created via a network of dairy researchers from over one hundred countries. The data is managed and analyzed 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 141 dairy companies and organizations support and make use of the IFCN.

In the 2019 Dairy Report of the IFCN, 136 farms in 68 dairy regions in 54 countries – representing 89% of total world dairy production - participated. The IFCN calculated the long term average world unprocessed milk price, from 2007 to 2015 at \$40 per 100kg SCM and found that at the end of 2015/16, a new reality dawned with an average price at \$35 per 100kg SCM (2016 to 2019). It is however “early days” for the “new” price level.

Country	Average number of cows in herd 2018	Average no of dairy cows 2018	Production of unprocessed milk (Mil t SCM) 2018
Saudi Arabia	7 139	30	2.21
South Africa	442	1 380	3.85
New Zealand	416	12 000	25.19
Australia	274	5 700	9.56
USA	241	39 000	95.31
Czech Republic	239	1 510	3.16
Denmark	204	2 800	5.95
Israel	186	700	1.51
Argentina	149	11 000	9.99
United Kingdom	148	12 800	15.39
Uruguay	136	3 280	2.33
Netherlands	94	17 000	15.28
Germany	65	62 800	33.14
France	63	56 000	24.78
Poland	10	230 000	13.65
India (dairy cattle and buffalos)	2	70 153 000	201.22

The global average dairy farmer owns two to three dairy cows. Larger herds are found in Saudi Arabia, South Africa, New Zealand, Australia and a few other countries. South Africa's average dairy herd size is one of the largest in the world.

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.

Source:
IFCN, Dairy Report 2019



The cost of **milk production**

The cost of milk production is the key cost component in the dairy chain. It indicates the competitiveness of milk production in a region/country compared to that of other regions/countries.

In the cost of milk production analysis it was found that 25% of the farms had a cost of milk production of ≤ 30 USD per 100kg SCM and are typically situated in Africa, South America and Oceania. The middle group consists of 64% of the farms with a cost of milk production between 30 USD and 60 USD per 100kg SCM and includes Europe, North America and Asia. The high cost producers, ≥ 60 USD per 100kg SCM, are found in Scandinavia, the Alpine region, Canada and Japan.

The average cost of milk production was calculated at 40.4 USD per 100kg SCM with a variation from 6 USD to 120 USD. The extreme 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 produced milk 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 a 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 and insemination and other costs.

South Africa rates amongst the lowest cost producers in the world.

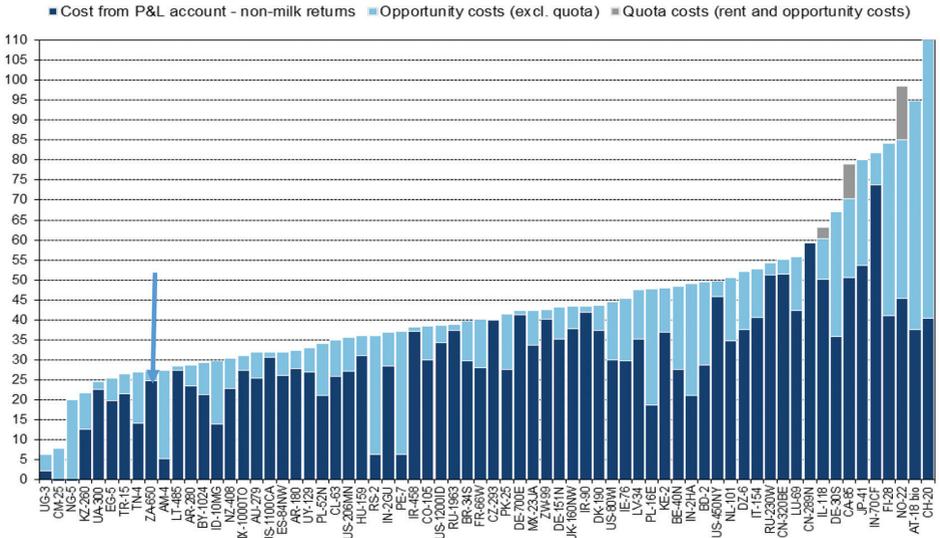
The two graphs on the next page show the cost of milk production on average sized and large sized farms between different countries.

For the average sized farm (ZA 650) South Africa is in the top 10 (number 9) low cost producers out of 68 farms and for the larger sized farm (ZA 800) SA is in the top 15 (number 15) low cost producers out of 68 farms. The position of the ZA 800 intensive total mixed rations farm weakened slightly from 2017, due to basic concentrates' prices which increased by 21% in 2018 (year-on-year).

Subsidies

The subsidy policies and implementation in countries and regions are complex. Taking Norway (NO) as an example, subsidies differ between regions. There is structural income support for milk production: a subsidy per dairy cow for the first five cows and a subsidy for grazing livestock. In Poland (PL), part of the EU, there is single farm payment subsidy and additional programmes for farming in a less favoured area.

Cost of milk production on average sized farms (USD per 100kg SCM)



MILK SA's GM — NOVEMBER 2019



On 27 November 2019, Member Representatives and guests of Milk SA gathered at Waterkloof Guesthouse in Pretoria for its biannual General Meeting. Well-known market commentator and Portfolio Manager at FNB Wealth and Investments, Wayne McCurrie, addressed the meeting on the world economic outlook and the South African economic outlook.

