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Global Dairy Developments and Perspectives for Sustainable Dairy Farming in India





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Foreword

From IFCN Managing Director



Torsten Hemme
Managing Director,
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IFCN is a global network of dairy researchers from over 90 countries and of about 100 agribusiness related companies and institutions. IFCN creates a better understanding of the global dairy world by providing globally comparable dairy data, outstanding knowledge and inspiration to widen your imagination. The focus is in the field of milk production, milk prices and related economic topics. The values of IFCN operation are based on three pillars: Trust – Independence – Truth. Trust among the IFCN partners is vital for open sharing, cooperation and network that really works. The IFCN is independent from third parties and is committed to truth, science and reliability of results. Truth means that IFCN shows the dairy world as it is and describes realities and reports as accurately as measurements allow without having any hidden agendas. IFCN started its work in India in 2000 comparing typical dairy farms in Haryana. During 2001-2005, with the support from the ProPoor project Initiative of FAO, the work was expanded to Orissa, Andhra Pradesh and Punjab. During 2006-2012, NDDDB joined IFCN as research partner representing India. Since 2008, NDRI is involved in the annual country profile analysis as research partner. In 2012, Arohana dairy joined IFCN as regional partner to represent dairy farming in Tamil Nadu. In 2013, GADVASU university from Punjab joined as regional partner from Punjab, India. Since 2014, Suruchi Consultants joined as research partner representing the commercial dairy farms in India.

IFCN has conducted two regional workshops in the past in India during 2013 and 2015 at Ludhiana and New Delhi respectively. The present workshop in Anand, Gujarat is a continuation of the series on the theme "Global Dairy Crisis: Lessons to be learned for dairy development in India." The aim of this joint report is an attempt to make available global dairy knowledge with the dairy stakeholders in India and develop open and inspirational ways and ideas to drive the Indian dairy development agenda forward in a sustainable manner.

Message

From Suruchi Consultants



Kuldeep Sharma
Chief Thinking Officer
Suruchi Consultants, India

Suruchi Consultants is a research based dairy consulting organization since 1990. From 2011 Suruchi has been publishing insightful documents for Indian dairy Industry including Dairy Vision 2020 and Dairy Vision 2030. A Unique report on Sustainable dairy Farm structure in India was published to unleash the changing Farm structure in India in 2015. From 2014 the dairy farm economics based research capabilities of Suruchi got enhanced by partnering with IFCN, Germany. Suruchi is applying Typical Farm Approach (TFA) method from IFCN in understanding the dynamics and farm economics of India dairy farm sector. In this joint publication Suruchi has provided insights on critical success factors contributing to sustainability of dairy farm business in India. This report also contains snapshot of challenges, policies and future road map for Indian dairy farm sector including an evolving farm classification system. This report is unique in presenting global dairy scenario and Indian dairying in global scenario. The last part of the report covers the Indian dairy sector including quick reflections on impact of demonetization on Indian farm structure by the author.

This report will be unveiled at the IFCN regional workshop "Global Dairy Crisis: Lessons to be learned for dairy development in India." at Anand Gujarat in November 2016. On behalf of Team Suruchi,

I wish the workshop a grand success.

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Introduction

Milk production in India has been growing at an average growth rate of 4.7% per annum for the last ten years closely matching the milk demand in the country with minor surplus for global trade in the last 3-4 years. The growth has happened in a volatile dairy market situation, nevertheless India has managed to insulate itself from it through tariff barriers and an inclusive support policy for dairy development. However, the challenge still remains, if India is able to maintain its insulation from the global trends and also meet its growing dairy demand. The challenges in ensuring a sustainable dairy development have been there and seem to have enforced more in the recent times. This is especially, with regards to milk quality; inflationary trends in inputs especially feed, huge imbalance in input requirement and availability; infrastructure bottlenecks and technology accessibility; exchange rate volatility; market access and penetration. IFCN, as a neutral knowledge provider to the dairy stakeholders, does look into the long term perspective of global dairy development scenario and also take lessons from the short term market situations as of the recent milk price crisis which has hit the EU, Oceania and USA farmers the hardest. It is also pertinent to see what are the factors governing sustainable farm structure and dairy development in a global perspective. A comparative assessment of the competitiveness of milk production among the major milk producing countries enables us to take a broader perspective for farm strategy development.

IFCN has in the past held two regional workshops in India with the intent of building up awareness and initiation for future dairy development strategies focusing on India's long term production outlook to be self-sufficient in the first workshop and on how to

sustainably grow milk production in India. The results in both the workshops have highlighted that the impetus to bring about higher productivity and farm structural changes will be more and more evident as India grows in the path of higher economic development and India needs to adapt with the changing times and need of the hour in the interlinked volatile world.

Hence, the present paper looks to set the background material for taking this initiative forward in setting the platform right for overcoming the challenges with the key dairy stakeholders. The paper first highlights the long term global dairy outlook 2025 to understand the opportunities in milk production, demand and trade in the different world regions. This is followed by the recent developments in newer equilibrium levels and standards in the continuing longest global dairy crisis in the last ten years. The dairy competitiveness of India in dairy farming is then compared with the major and similar economic peer countries to understand the developments in a global perspective. Finally, the perspectives and factors for sustainable farm structural development in an Indian perspective is discussed. The overall goal of this paper is to provide momentum to the present initiatives being taken by the different stakeholders but also to come up with a joint action plan that will lead to a more sustainable dairy for all the dairy stakeholders in the dairy chain.

1. IFCN Dairy Outlook 2025



1.1 The Global Dairy Developments Until 2025

Meeting the complexity of a rapidly changing dairy sector

Today the dairy world is serving over 7 billion consumers and providing livelihoods for approximately 1 billion people involved in the dairy chain. In the future, even more people will need to be served with dairy products. Indeed, the dairy sector with its complexity entails great challenges due to its high rate of significant changes, influenced by economic and political decisions and drivers. In response to this, IFCN aims to answer upcoming questions concerning the development of the dairy world in the next 10 years and its crucial structural changes.

A global picture of the dairy world in 2025 is based on an extensive collection of data (obtained since 1996) and the expertise of the IFCN Network. The aim of producing a long-term outlook is to provide all stakeholders of the dairy value chain with a clearer understanding of future developments in the dairy sector. Therefore, this analysis is the result of a lengthy cooperation between many international IFCN Research Partners and the IFCN Center.

Background on the IFCN Outlook

IFCN has been producing the IFCN Long-term Dairy Outlook annually since 2013. Stakeholders and political institutions are able to use the outlook for guidance and strategic planning, as future markets, shifting supply as well as demand patterns are monitored and global potentials in dairy production are made out.

Data and Method used

The IFCN Outlook covers each dairy country in the world and considers all milk produced. Therefore, besides cow and buffalo milk (representing 95% of all milk) also sheep, goat and camel milk is included. The standardisation of data is a key element to insure comparability between countries. One example of this is the

standardisation of milk production to 4.0% fat and 3.3% protein (Energy Corrected Milk-ECM). The key method of the IFCN Long-term Dairy Outlook is an iterative country supply/demand modelling process. This process is concluded once a world milk price level is found where demand growth equals supply growth.

The IFCN-Long term Dairy Outlook is produced based on the feedback of the 100 IFCN Research Partners considering the last 12 months. IFCN maintains a database of 12 variables which describe the dairy world. The network validates this data every year and consequently has enabled a stable high quality process since 2013. The main assumption of the outlook is a long-term balance of supply and demand. First, IFCN determines the two most relevant drivers of the dairy world, with which a scenario matrix is constructed.

Secondly, IFCN selects the most probable scenario. Coupled with this, different assumptions are implied. Based on the mentioned assumptions, an iterative world supply/demand equilibrium modelling process is run to determine a world price level that will allow milk production on a level to cover demand. Thus diverse data for around 200 countries, describing the dairy world for the next 10 years, are generated. In the following paragraph, scenarios and assumptions of the IFCN Long-term Dairy Outlook are discussed.

IFCN Scenarios and Assumptions

As has already been mentioned, the scenario matrix (see chart) is built on two key variables of the dairy sector. IFCN assesses future consumer preferences for milk and future policies as the most crucial variables having an impact on the dairy world until 2025. Based on IFCN Data and Knowledge, it considers scenario 1 as the most probable one of the matrix. This scenario assumes positive consumer preferences in terms of milk and favourable policies facilitating peace, open trade and a positive level of GDP. Related to

Table 2. IFCN Long-Term Dairy Outlook Scenario Matrix

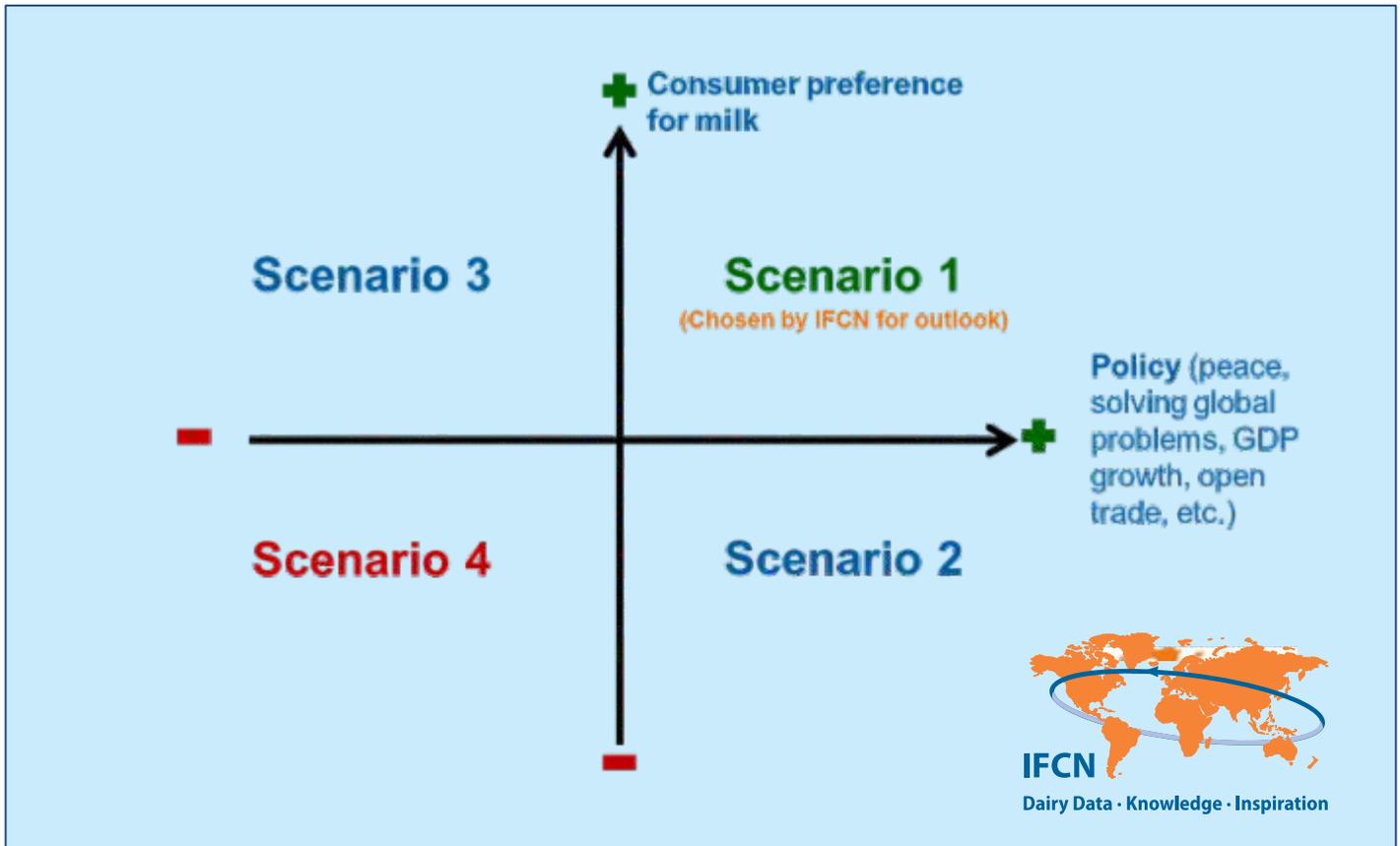


Table 3. IFCN Outlook Technical Assumption based on Scenario 1

- Global GDP growth: 3.6% (IMF 10.2015)
- Exchange reatge: 1.17 USD.EUR or 0.85 EUR/USD
- Oil Price: 75-80 USD/barrel in 2025 (IMF 2/2015)
- Weather: average condition (IFCN assumption)
- Policy: no distortion (moving in line with IFCN scenario 1)
- World Feed Price: 27 USD/100 Kg feed (OECD-FAQ Outlook 7/2015)

this, a demand growth by more than 20 t milk (ECM) a year is assumed.

Based on the chosen scenario certain macroeconomic and technical assumptions (see table) are applied to the outlook. While some assumptions are based on external sources, other assumptions are derived from IFCN Expertise. However, other scenarios than the chosen one are possible. In that case, assumptions need to be adjusted based on the scenario and the

modelling process needs to be performed once more. As economical and political conditions can change quickly, IFCN revises the dairy world every year and aligns the IFCN Long-term Dairy Outlook.

The IFCN Long-term outlook and its results

Technically the IFCN Long-term Dairy Outlook is a 10 year forecast. This contains a database of the key dairy parameters per country.

IFCN Dairy Outlook 2025

The 2015 Outlook is based on the defined scenario 1 (see annex). According to this, IFCN assumes future positive consumer preference for milk and favourable policies and economic situations. Coupled with this scenario, macroeconomic assumptions are applied to model the milk supply and demand growth. Therefore the results will be interpreted considering these defined frame conditions.

Long-term milk price level: As a key result, a long term world milk price of 41 USD/100kg milk (ECM 4.0% fat, 3.3% protein) is estimated. At this price level, it is predicted that world milk demand and supply will balance out. Compared to the average milk price level in 2015 this level is 46% higher. Nevertheless, this level is

comparable to the average world milk price of 40 USD/100kg milk in the time frame 2007 to 2014.

The dairy growth story is expected to continue: In the last 10 years milk demand and supply increased by 26% or annually by 2.4%. IFCN predicts, for the next 10 years, a growth of 25% which will be an average annual growth of 2.3%. Even though this percentage of growth is lower than in the past, the volume growth will be stronger compared to the last 10 years. According to this, 208 mill ton more milk will be consumed and produced. This represents 8.5 times the current milk volume of New Zealand. The details can be found in Table 1 or in the bullet points below.

Table 1: The Dairy World 2005/ 2015/ 2025

World	Unit	Absolute Values			Changes 2025 vs 2015		
		2005	2015*	2025	Absolute	%	CAGR % /Year
Milk Supply and demand							
Milk production »Milk demand**	mill ton ECM	657	830	1038	208	25%	2.3%
World trade							
Excl. EU-28 intra trade***	mill ton ECM	41	53	79	26	51%	4.2%
Supply drives							
Number of milk animals	mill head	327	370	405	35	9%	0.9%
Average milk yields	ton/milk animal/ year	1.9	2.1	2.5	0.4	14%	1.3%
Farm number	mill	111	121	103	-17.5	-15%	-16%
Average farm size	head/farm	2.8	2.9	3.7	0.8	28%	2.5%
Demand drivers							
Population	billion	6.4	7.3	8.2	0.9	12%	1.2%
Dairy consumption per capita	kg ME/capita/ year	101	114	127	13	12%	1.1%

Explanations:

Result based on scenario 1 (High milk demand due to consumer preference and benefits political and economic situation)

*Preliminary data of year 2015, partly estimated

** Small deviations of total supply and demand due to changes in stocks

*** Representing volume traded from surplus countries: imports from net exporters not included

ECM- Energy corrected milk (standardise to 4% fat and 3.3 % protein)

ME+ Milk equivalents, method. "fat and protein only"

CAGR= Compound Annual Growth Rate

Status of Data :03/2016



Population growth and higher per capita consumption drives future demand. Until 2025, global population will increase by 12% up to 8.2 billion people, so almost 1 billion more consumers will demand milk products. Global per capita consumption will increase by 13 kg ME per year (127 kg per person). The highest increase in per capita consumption will take place in South Asia (+30%) up to 174 kg ME per person.

Trade of dairy products will gain further relevance. Within the time period 2005–2015, world trade increased by 29%. Looking at the next 10 years, the net trade is expected to increase by 51% up to 79 mill t milk (ECM) in 2025. This reflects the increasing importance of trade in the dairy world and the development of shifting dairy production to more competitive locations.

The dairy world will have new net importers and new net exporters. In 2025, some countries will have changed their net trade status. While India and Iran are predicted to be net importers, thus demand exceeding production, Romania will play a role as a net exporter, so production will be higher than consumption. However, some countries will strengthen their current position. While China, Africa and Pakistan will increase their net imports, EU-28, New Zealand, Belarus and Argentina will increase their net exports.

Level of global milk supply will keep on growing and cover global demand. Milk production is expected to increase by 25%, up to 1038 mill t milk (ECM) in 2025. Half of the production growth is expected to take place in South Asia. Regional supply will increase by 45% to 327 mill t milk (ECM). While Eastern Europe will increase by 16% and provide 17 mill t milk (ECM) more, Western Europe will increase production by 9%, and additionally increase by 13 mill t milk (ECM).

There will be 405 mill dairy animals in the world in 2025. On a global level, the growth of the number of dairy animals will slow down from 13% (2005–2015) to 9% (2015–2025). However, South Asia will increase its number of dairy cows and buffalos up to 177 million and Africa will have 80 million milk animals. Together they will represent 63% of the total dairy animal population in 2025. EU-28 will decrease the number of dairy animals by 3%. An additional driver for milk production growth is the milk yield per dairy animal. This is expected to increase by 14%, reaching an average of 2.5 t/milk animal/year.

Fewer farms, but larger farm sizes in 2025. In the next 10 years, the number of dairy farms will decrease to 103 mill, so fewer farms will produce a greater amount of milk. Merely in Africa, more dairy farms will emerge (+11%). South Asia will lose 17% of its farms but increase its average milk yield by 31% per milk animal. Average world milk production per farm has been increasing by 16% in the last 10 years and it is expected to increase further by 47%.

1.2 Dairy Developments In India Until 2025

Keeping in perspective, the baseline assumptions on global sector developments and corresponding impact at national level for India, the following outlook on baseline projections for India is done. Milk production in India has been growing at an average growth rate of 4.5% and will continue to grow at 4.2% for the next 10 years to reach 255.4 million ton ECM from the present 177 million ton ECM in 2016. This will be mainly driven by growth in animal population by 1.1% and yield growth by 3.1%. The growth in milk yield is mainly driven by farm consolidation leading to about 14 million farms being replaced by bigger farms with herd size increasing from present average of 1.3 animals per farm unit to 1.7 animals per farm unit.

Milk consumption on the other hand has been growing at an average of 4.5% and will continue to grow at an average of 4.3% for the next 10 years. The main drivers for the growth in milk demand is the rising income leading to increased consumption of milk from the present 135 kg ME per capita per year to 176 kg ME/capita per year at an average growth rate of 3% per annum. This is evident from the growth in GDP/year averaging presently at around 7% and long term average is predicted at 5.7% per annum. The second driver is the rise in human population at 1.3% per annum leading to the human population increasing from 1.3 billion to 1.47 billion by 2025. This will lead to present milk demand of 177.2 million ton ME in 2016 to increase to 259.7 million ton ME by 2025. This will lead to a net trade deficit of 4.3 million ton ME by 2025, which is 1.7% of milk production. On the other hand, there is a golden opportunity for India to harness the global trade prospects showing significant rise in the next 10 years.

It needs to be seen with the present social and economic transition happening in India, how the drivers for the growth in milk production and milk demand responds.

Feedback welcome: The IFCN Long-term Dairy Outlook is an ongoing research project. Therefore IFCN will appreciate receiving any feedback to improve the work further. The next IFCN Outlook 2026 and its database will be available in March 2017. For any comments or questions, please contact us at info@ifcndairy.org.

The present dairy crisis during 2015–16 has affected the dairy stakeholders in varying intensity in different regions of the world. The next section looks into how the world has managed the dairy crisis and what can we learn from the crisis.

2. IFCN Overview on Milk Prices and Costs in 2000-2016

2.1 The Dairy World in 2015

- 830 mill ton** = World milk production of all species, standardised to ECM 4.0% fat, 3.3% protein
- 114 kg/year** = Average world consumption per person in milk equivalents
- 2.9 milk animals/farm** = Average world dairy farm size related to cows or buffalos
- 2.1 ton/year** = Average world milk yield per dairy cow/buffalo
- 28 USD/100kg milk** = Annual world milk price level

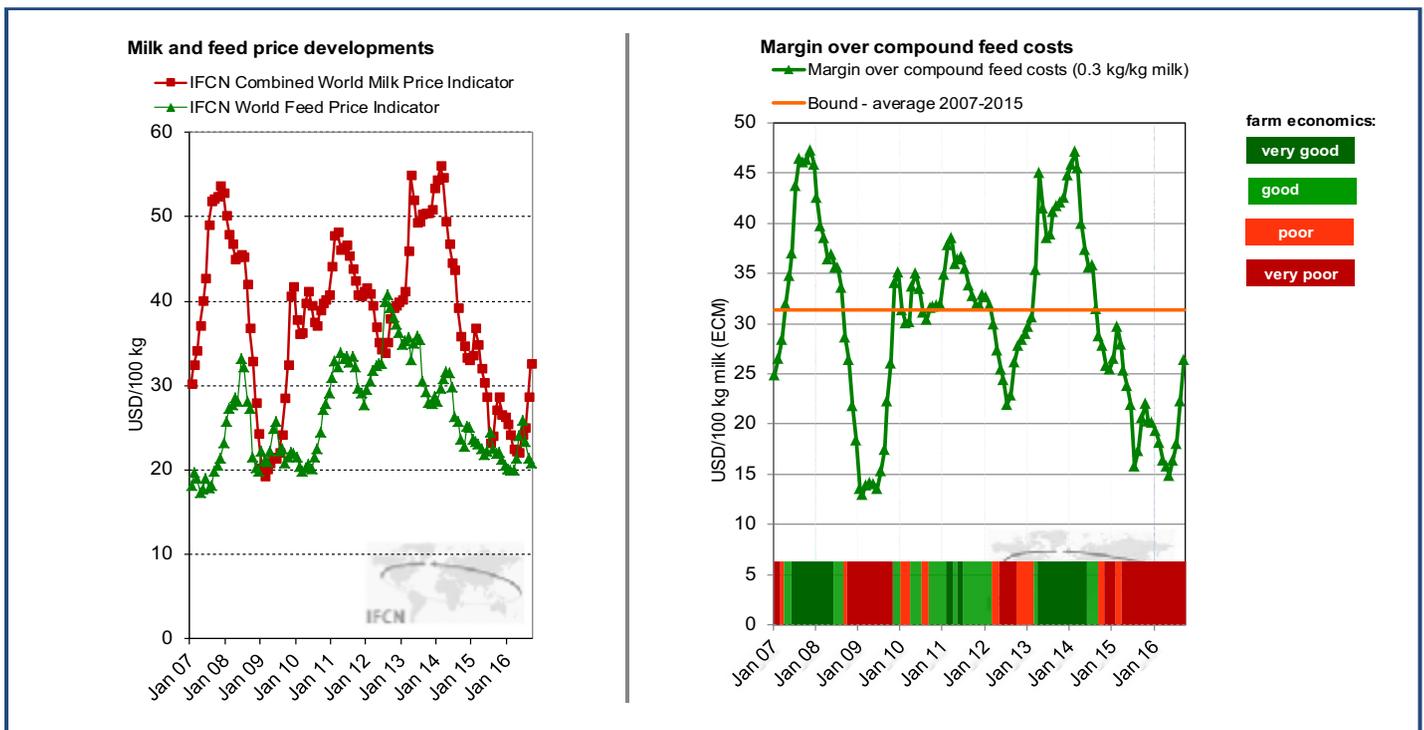
The years 2015 and 2016 have constituted the third world milk crisis since 2007. After a highly profitable year 2014 with the highest world milk price ever monitored, the world milk price started a free fall and reached its lowest level in May 2016. However, milk production has continued to increase by 1.8% in 2015 to touch 830 million ton ECM (Energy Corrected Milk with 4% fat and 3.3% proteins). 80 % of the milk supply increase is estimated to come from the EU and India. China and USA are slowing down production, while Brazil, Turkey and New Zealand are reducing production. To get a clearer perspective on the economic factors behind these developments, the article looks at the development of milk and feed prices and margins over compound feed costs at world level for the last 20 years. Besides, costs of milk production only were analysed for six major milk producing countries since 2000, with the addition of an estimate for 2016. This article provides

a detailed understanding of dairy economics including the relation between milk and feed price at world level and milk production costs at farm level. The time series data offer insights of the developments for nearly two decades.

2.2 Milk and Feed Prices Development 2007– 2016

The development of the world market prices for milk and feed are shown in **Chart 1**. The world milk prices are based on the weighted average of three IFCN World Price Indicators: skim milk powder & butter (35%), cheese & whey (45%), and whole milk powder (20%). The IFCN World Feed Price Indicator represents the world market price level for feed. The calculated feed price indicator is based on the price for a diet comprising 70% corn (energy feed) and 30% soybean meal (protein feed).

Chart 1. World milk prices for milk and feed 2007 September 2016



Source: IFCN Dairy Database on monthly real time data on production, prices and farm economics, September 2016



IFCN Overview on milk prices and costs in 2000-2016

Trends in milk price developments

Since 2007, the milk price indicator has shown a roller coaster behaviour, swinging between less than 20 USD per 100 kg ECM (energy corrected milk with 4% fat, 3.3% protein) to peaks of 56 USD. Low milk prices of less than 25 USD/100 kg ECM throughout 2006 were followed by a steep increase to more than 50 USD at the end of 2007, just to be followed by a sharp decrease to 20 USD in early 2009. Between January 2010 and January 2013, fluctuations were less extreme. During this period, the milk price varied around 40 USD, with a range between 48 USD in March 2011 and 34 USD in July 2012. This low point was followed by a strong increase to a level above 50 USD for nearly a year, peaking at 56 USD in February 2014. The ensuing decline continued with two minor recoveries until May 2016. By that time, the milk price had dropped by approximately 34 USD to 22.1 USD within nearly 2.5 years. Since June 2016, a recovery has taken off. Whether this initiated a lasting upturn, remains to be seen.

Trends in feed price developments

The feed price indicator also showed fluctuations, though to a lesser extent than the milk price indicator. Besides, their behaviour was not synchronised, i.e. peaks in the milk price did not necessarily mean peaks in the feed price. Until 2010, the feed price hovered around 20 USD with the exemption of June 2008, where it reached 32.2 USD. Between January 2011 and June 2014, the feed price was generally higher than 20 USD. In August 2011, the threshold of 40 USD was surpassed for one month. Since June 2014, the feed price has declined by more than 10 USD to 22 USD. The highest difference between milk and feed price was noticed in August 2007 at 33.8 USD. The very low milk prices in the first half of 2009, and the summers 2012, 2015, and 2016 were accompanied by feed prices that were actually higher per 100 kg, causing an unfavourable relation between the two commodities. The latest upswing in milk prices was accompanied by declining feed prices, indicating a starting positive trend for farm economics.

Dairy farm profitability- margin over feed costs

The margin over feed cost indicator assumes an average feed intensity of 300 g compound feed per 1 kg milk. This feed intensity could represent a farm with a milk yield of 8000 kg milk / cow / year using 2.4 ton of compound feed per year. From the IFCN perspective, the margin over compound feed indicator describes dairy farm economics in real time well, since it considers the feed intensity and weather condition. It also enables us to assess the intensity and depth of farm economics situations. The margin over compound feed cost demonstrates farm economics after having taken into account the milk and compound feed prices given. For farming systems which operate at a lower milk yield and lower use of compound feed per kg milk, the fluctuation of the margin over compound feed is generally only influenced by milk price developments. On the other hand, dairy farming systems with

much higher milk yields and higher compound feed use are strongly driven by a combination of milk and compound feed price, especially when exposed to world market prices.

The cause and impact of the global dairy crises

The very high milk and low feed prices in August 2007 followed by low milk and high feed prices quickly led from a very profitable situation at the end of 2007 to a negative margin over compound feed cost by the end of 2008. It was the beginning of a rollercoaster and **the first global dairy crisis** which lasted for 14 months. The next phase was a period of relative stability of the milk price on average of 40 USD/100kg ECM. Later in 2011, milk price began to decrease while feed price continued to rise. In this period, the margin over compound feed cost started decreasing in March 2011, dipping below the long term average of 32 USD/100kg in February 2012. That was the beginning of **the second global dairy crisis** which had its epicentre in mid-2012 when milk prices dropped and feed prices rose towards new highs. After 10 months, the recovery of milk prices started in 2013 and the relatively low feed prices in that time brought highly favourable farm economics from autumn 2013 until the end of 2014.

The year 2015, a new rollercoaster started when milk prices kept falling to very low levels – the start of **the third global dairy crisis**. Observing the world milk price development and the drop of 60% of the world milk price from February 2014 to May 2016, IFCN assumes that the world milk price has just passed the nadir of the current roller-coaster price scenario. The September world milk price showed an increase of about 48% compared to May 2016, besides the world feed price decreased by 16% since June 2016. Despite this positive development of the two world prices and an increase of the margin over compound feed cost from 14.9 USD in May 2016 to 22.3 USD/100 kg milk in August 2016, farm economics has not improved significantly yet due to the depth of the crisis. Farm economics have been judged as poor or very poor for the last 26 months, but there are signs that the trend has reversed and economics will improve slowly. Country-wise the farm economics situation is similarly bad: 45 out of 60 countries analysed face poor and very poor farm economics.

This crisis has dragged on for so long, as the equilibrium of demand and supply got seriously disrupted. On the one hand, the world-wide demand was weakened because of the Russian embargo and a reduced import of dairy products by China, on the other hand, the abolition of the milk quota in the European Union and generally low feed prices enticed the farmers to produce on a high level. The extraordinary length of this crisis has taken its toll as the buffer capacity of farms reached its limits and the structural change has been accelerating. Increases of the world milk price together with decreasing feed prices in the late summer 2016 are taken as positive signs for a recovering world milk market.

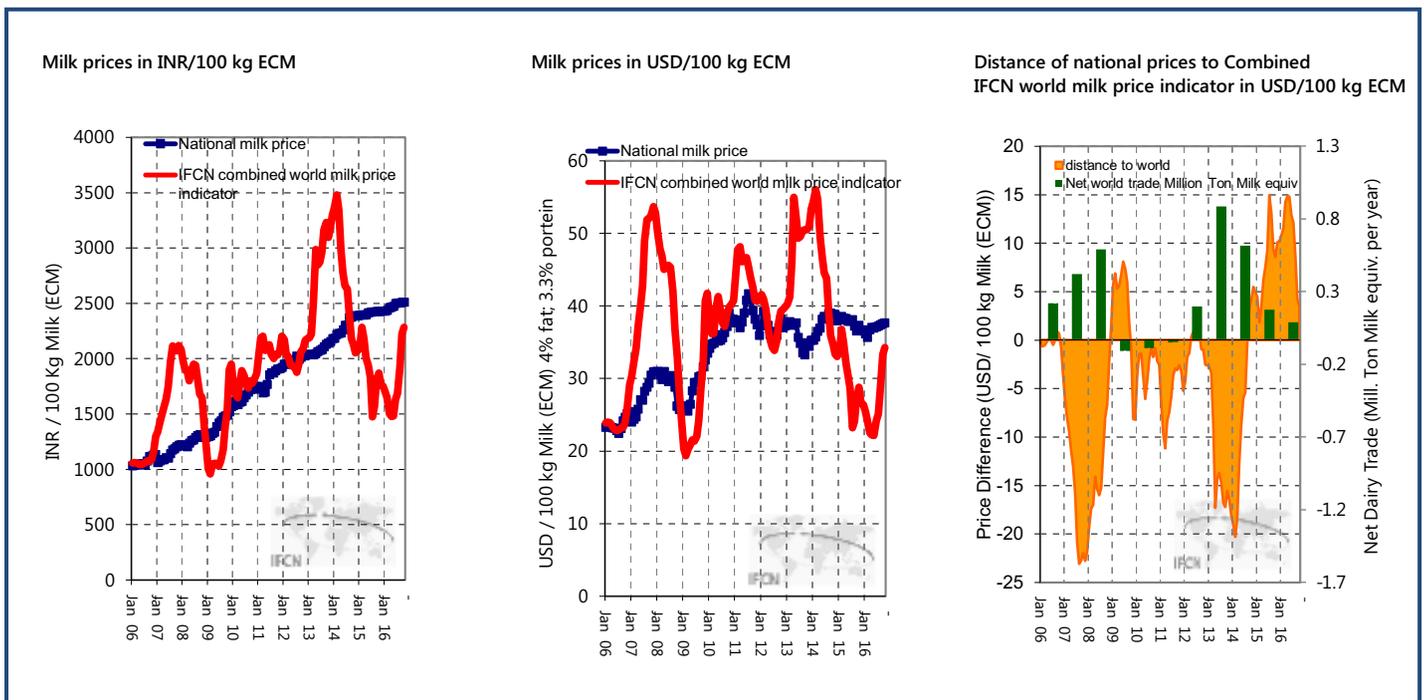
IFCN Overview on milk prices and costs in 2000-2016

2.3 Milk Price Developments In India vs. World

Though world milk prices have shown high variability during 2006-2015, average Milk prices in India have shown more or less a stable growth in milk prices since 2006, as seen in chart 2.

There have been very less price transmission between world and Indian milk price especially during peaks. India has more or less a protected market not affected much by the volatility in world markets.

Chart 2. Milk price in India vs World and Trade Jan 2006 September 2016



Currency devaluation has tended to follow the dairy crisis in 2009, 2012 and 2015-16 very closely causing lower milk prices in USD terms during this periods. The present dairy crisis 2015-16 has not affected the Indian farmers much with milk prices remaining 10-15 USD higher than the world milk prices. However, farmers also donot benefit when the milk prices reached their peaks in 2007-07 and 2013-14, due to prices remaining stable or even going down in 2013-14 due to currency devaluation. These periods, when national prices have remained lower by 15-20 USD than global milk prices, India has taken advantage of net milk equivalent exports upto 1 million ton Milk equivalent, signifying high potential for global dairy trade by India to earn foreign exchange and benefit from higher margins from higher international dairy commodity prices by Indian dairy processors. It remains to be seen if the benefits gained from trade is percolated to the farm level by the processors.

As India gets more and more integrated to the world markets, there will be a tendency to align with world prices, when volatility plays a big role in maintaining sustainability and managing risks.

2.4 Cost of Milk Production 2015 By World Region

The annual IFCN work of comparing typical farms around the world has been an on-going process since the year 2000. Since then, the number of countries participating has increased from 8 to over 50. Moreover, the number of dairy farms analyzed has increased from 21 to around 150.

The IFCN Methodology applied for data collection, economic analysis and results validation uses the three elements:

- a network approach of researchers continuously co-operating,
- the concept of typical farms described below and
- a standard model TIPI-CAL (Technology Impact Policy Impact Calculation model) to ensure technical comparability of indicators.

IFCN Overview on milk prices and costs in 2000-2016

A typical farm represents the most common production system which produces a significant proportion of milk in a country or a region. Usually, two farm types are used per dairy region – the first represents an average farm and the second a larger farm type. The typical farms were built and validated by a combination of accounting statistics and a panel of dairy experts. The data collection and validation were done by researchers in the represented countries, researchers in the IFCN Dairy Research Network and also during the IFCN Dairy Conference held in Belgium in June 2016.

ECM correction: As the dairy farms operate with milk of very different fat/protein content, the IFCN uses the energy correct milk (ECM) approach to standardize milk volumes to 4.0% fat and 3.3% protein. The following formula was used: ECM milk = (milk production * (0.383 * % fat + 0.242 * % protein + 0.7832) / 3.1138). The variability of economic value of milk components in national markets is not accounted for in this standardization method.

Cost indicator: The IFCN uses the indicator cost of milk production only which can be directly related to a milk price. This cost includes all costs from the profit & loss account of the farm. From this cost level, the non-milk returns from sales of cull cows, heifers, calves, manure, etc. and returns from coupled direct payments have been deducted. Furthermore, the opportunity costs for own labour, land and capital are also included. For creation of the world map, the average size farm from each country was used.

Competitiveness of milk production in 2015

Cost range: Cost of milk production ranges from 8.5 USD per 100 kg milk in extensive farming systems in Uganda (where beef is the major output and milk is a side product) to 106 USD for an average sized farm in Switzerland. The average cost over all countries analysed was 40.5 USD/100 kg milk.

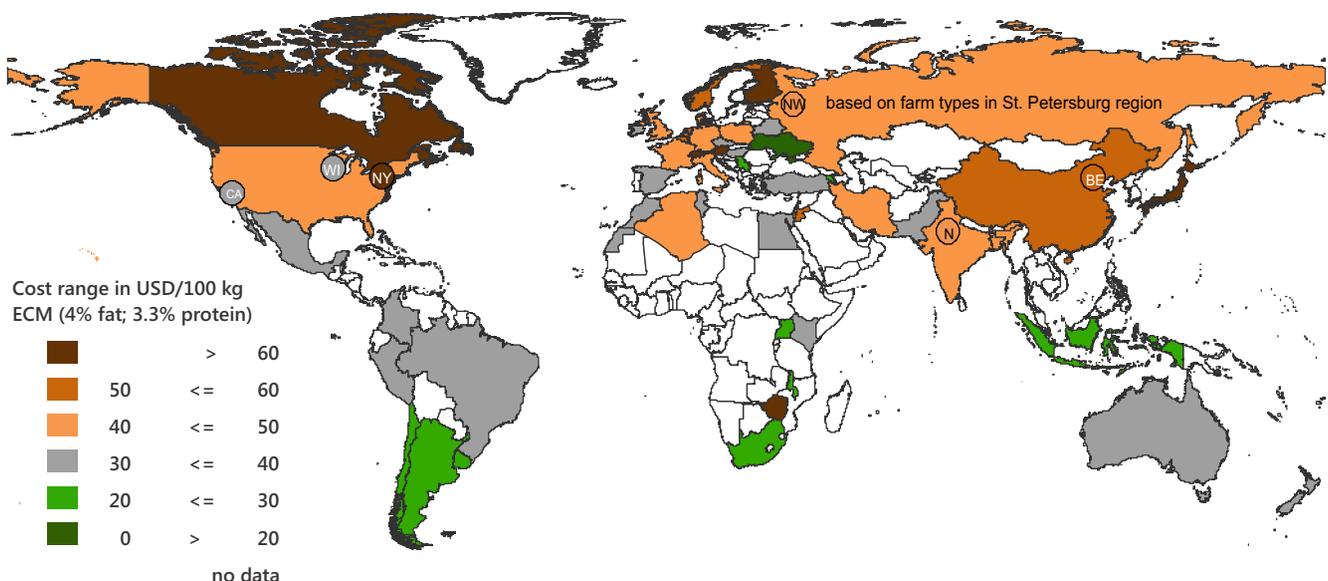
In **Chart 3**, a simplified global overview on costs of milk production is shown. The illustration is based on the results of the typical average sized farm analysed per country in 2015. The results can be summarised as follows.

Low cost regions: Based on the average sized farms, three low cost regions have been identified: a) Argentina, Peru, Chile and Uruguay b) Central and Eastern Africa c) Some farms in the CEEC as well as Indonesia.

Western Europe: The leading average sized farms in Western Europe had costs ranging from 40–55 USD.

The US: The smaller farm types in the Eastern Region of USA i.e. Wisconsin and New York had production costs ranging between 45 and 60 USD, respectively. In the western region, the large farm in California had the lowest cost of about 35 USD.

Chart 3: Cost of milk production only on average sized farms 2015



IFCN Overview on milk prices and costs in 2000-2016

Oceania: The cost level in Oceania was very homogeneous about 31.5 USD with very small deviations. It is important to note that New Zealand cost estimates refer to the seasonal year i.e. July 2014 – June 2015.

India: The cost level in India is based on a typical average household farm in Punjab. This is an average-sized farm in the North of India (state of Punjab) with 5 ha land, representing 5% of all farms and 11% of all cows in India. The dairy animals are either of a local breed or non-descript buffaloes, yielding around 2100 kg milk per buffalo and year with a fat content of 7.5%. The buffaloes are kept in a tie stall barn and are milked by hand. Crop farming is the main activity while dairying is a subsidiary activity. Most of the work is done by family members. The cost level was about 47 USD, which is much higher than the global average in 2015 and similar to costs in Western Europe. It is important to note that a larger typical farm in Punjab, India can produce milk at a much lower costs of 35.4 USD per 100 kg milk (ECM).

Fact: Hence, on an average, the milk production costs for the year 2015 were lower than in 2014. As the milk price decreased to a larger extent than the production costs, farm economics were difficult for many dairy farmers in the world.

Cost of milk production developments 2000 – 2015/2016 (estimated)

It is very important to comprehend the average cost trends of typical farms over a period of time to understand the factors behind the competitiveness of milk production. It also enables IFCN to take a view on the levels of milk production costs to sustain milk supply levels or the milk price level in the short and medium term. Hence, in this part of the analysis, IFCN tends to compare the cost trends of average typical farm types from the six major milk producing nations representing the major regions of the world.

Germany (DE-131N): This farm type stands for an average farm in Northern Germany representing 13% of the farms and 46% of cows in the country. The farm has grown from 68 cows in 2000 to 131 cows in 2015 at an average annual growth rate of 5.7%. In the year 2000, the costs were 28 USD/100 kg milk and increased towards 42 USD per 100 kg milk in 2006. The key driver was the appreciation of the Euro (+36%) and moderate increase of costs in Euro terms. From 2008 – 2012, the costs showed a declining trend towards 42 USD per 100 kg milk. The key drivers were a devaluation of the Euro by 14%. Costs increased again to 50 USD in 2014 due to higher feed and energy prices and labour costs in Euro terms. There was a decrease to 40 USD per 100 kg milk as a result of the depreciation of the Euro.

USA (US-500WI): This farm type is a larger family farm in the range of 200-1000 cows and represents 3% of the farms and about 12% of the cows in the USA. This farm has been in the data base since 2000. In the US, costs were relatively stable from 2000 to 2006 as inflation driven change of input prices could be compensated by increasing milk yields. Once feed prices started rising, this had a direct impact

on these farms and costs, which increased by 50% to a level of 38.5 USD per 100 kg milk. The sharp drop in costs in 2009 can be interpreted as a result of very bad milk prices, when farmers tried to cut costs wherever possible. Until the year 2012, cost had increased – mainly driven by feed prices - towards 44 USD per 100 kg milk. They have stayed between 40 and 45 USD per 100 kg milk for the last five years. Costs are estimated to drop below 40 USD in 2016 because of falling feed prices.

New Zealand (NZ-349): The typical farm representing an average sized farm covers about 45% of the farms and 68% of the cows in New Zealand. This dairy farming system was a world leader in cost competitive milk production in the year 2000. IFCN identified costs of 12 USD per 100 kg milk, which was the lowest cost level in those days. Driven by an increase in input prices and an appreciating currency, costs increased to a level of 40 USD per 100 kg milk in 2014, but decreased to 30 USD in 2015 and 2016. This decrease was based on a depreciation of the NZD against the USD and cost saving measures on farm.

Brazil (BR-23S): This typical farm in the South of Brazil stands for 22% of farms and 31% of dairy cows in Brazil. The costs of this farm were steadily increasing since 2009, due to a revaluation of the Brazilian Real in 2011 which pushed production costs in USD. The increase in labour costs in 2012 was stronger than the devaluation of the Real, leading to increased costs in 2012. Costs remained stable at around 40 USD for three years. The devaluation of the Real was stronger than the increase in costs which led to a decrease in production costs in USD by 25% in the last two years.

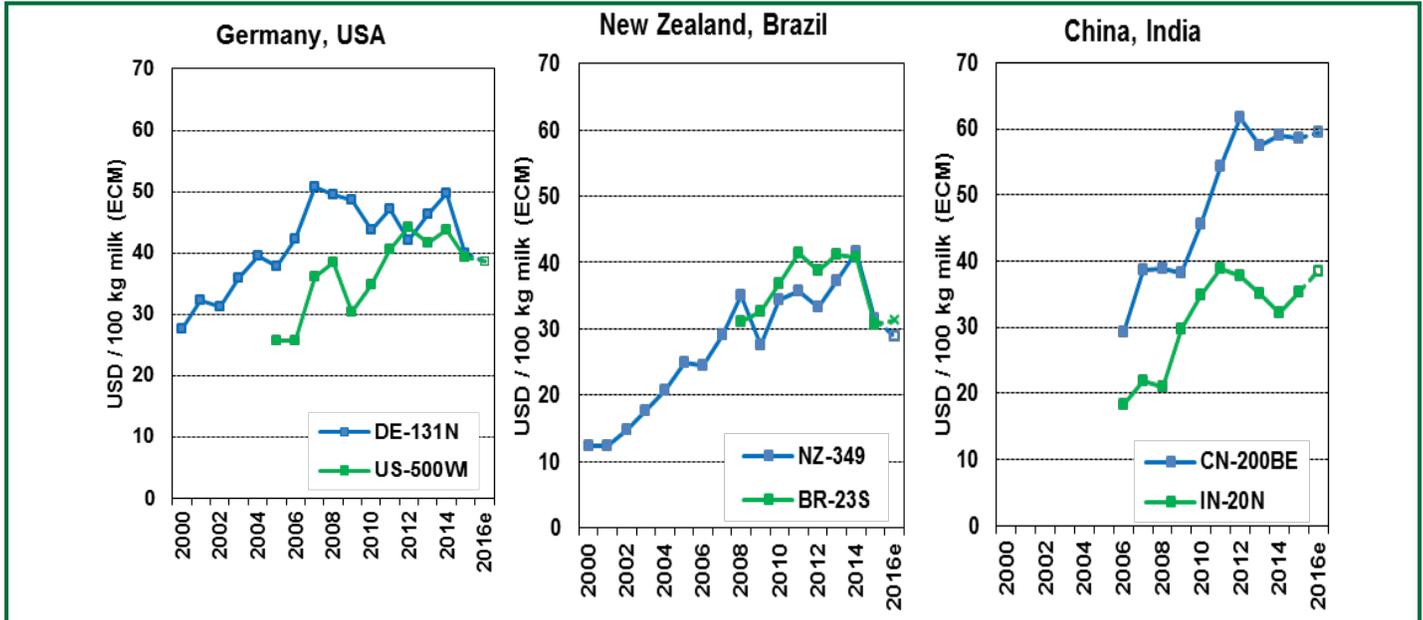
China (CN 200BE): This typical farm represents 30 to 40% of the farms and is a larger farm type in China in the range of 200-500 cows. It has been monitored since 2006. It enables IFCN to understand the dynamics of cost trends in China. Since 2006, a strong increase in cost due to the appreciation of the Yuan could be seen. In 2012, the Yuan had gained value by + 25% to the USD compared to 2000. The costs on Chinese farms did not drop sharply in 2009 as was observed in most other countries, because the drop in prices in national currency was almost fully compensated by the appreciation of the Yuan. In 2010, rising feed prices were a strong driver for increasing cost of production to about 60 USD per 100 kg milk where costs have remained since.

India (IN-20N): This farm denotes a larger family farm type in India in the range of 5-35 cows, currently representing 3% of the farms and 15% of the cows. However, it contributes a large proportion of the milk delivered to the processor. This farm has been monitored since 2006. The herd size has been fluctuating between 18-22 cows. The production costs showed a permanent upward trend until 2011. The main drivers were increasing feed and land prices as well as the extraordinary rise in salaries. This increase stopped in 2012 as rising input costs were compensated by a higher milk yield per cow and a depreciation of the currency. In the last two years, costs per 100 kg milk increased again, mainly because of rising feed costs and salaries.



IFCN Overview on milk prices and costs in 2000-2016

Chart 4. Cost of milk production 2000 – 2015/2016 of typical dairy farms in 6 countries



Legend on farm types: DE-131N: 131 cow family farm in Germany-North; US-500W: 500 Cow family farm in Wisconsin; NZ-349: 349 family farm in New Zealand; BR-23S: 23 cow family farm in Brazil-South; CN-200BE: 200 cow business farm in China, Beijing; IN-20N: 20 cow family farm in India-North. Data for 2016 were estimated based on the average milk and feed prices (January to August 2016) and exchange rate.

Facit: Dairy farm benchmarking - A tool for dairy development

In times of significant changes in dairy related output prices, farm input prices, and exchange rates, it is extremely important to benchmark the competitiveness of the current dairy farming system annually. Competitiveness in this sense has two meanings: the farm should be competitive on the market for dairy products

and should also be competitive on the local market for production factors, especially land and labour. Such benchmarking exercises enable all dairy stakeholders to see and react faster to threats, but even more to anticipate opportunities which will arise.

The following section looks into the specific issues linked to Indian dairy cost competitiveness developments and in real time and farm structural changes of relevance in the future.

Outlook of Milk Production Costs in India in 2016

Though the Indian Rupee has depreciated by around 4.4% in the first half of this year, inflationary trends in feed prices by about 11% has overshadowed the prospective gains in global competitiveness in milk production. This will cause milk production cost increase further by 9% to 38.5 USD/ 100 kg ECM from 35 USD / 100 kg ECM. Milk prices in 2016 is likely to decline by 2% due to currency devaluation and only 2% increase in local currency. This is bound to erode the farm income for the large family dairy farming systems further. However, the milk prices at 40 USD are much higher than the present world price level at 29 USD, making the dairy farmer in India in a fairly much better situation being insulated from the price volatility in the global markets.

On a global perspective, Milk prices in Germany DE-131N farm is still at very low levels of 26 USD, 14% lower than 2015. This puts the farmers in a deep ongoing crisis with costs at about 39 USD,

similar to 2015. The Euro currency also has stabilized in 2016 at 1.11 USD/ Euro. The farm income is negative at 0.8 USD even after farm subsidies are included. Typical farms in New Zealand have however, made cost cutting measures in 2016 to reduce costs by 6% reaching 29.5 USD/100 kg ECM. The main factor for cost reduction has been lower feed price by 16% over 2015. Though milk prices are still much lower at 27.7 USD, farm income is positive at 5.9 USD/ 100 kg ECM and could overcome the crisis better. Interestingly, even bigger farms in India have reached cost levels much higher than New Zealand and similar to in Germany, signifying eroding competitiveness in India and opening up markets in India will cause severe economic problems and milk supply unless suitable and significant steps are taken to improve farm sustainability.¹

¹ Details to be delivered during IFCN analysis and Dairy Conference in 2017.

3. Sustainability of Indian Dairy Farming Systems

India's 2016-17 forecast of milk production is pegged at around 1.6 billion liters' subject to normal monsoon (which has already occurred) and considering a growth of over 4% over the previous year. The estimated production for SMP and ghee is estimated to be about 0.57 Million metric tons and 5.4 Million MT respectively. SMP production may show a slight increase provided global commodity prices move north catching up the current improving trend..

Poor genetic potential of our animals is still a big challenge and even for exotic cross breed animals the yield is just one fourth that of the developed world. Water buffalo remain as a first choice of most of the farmers in the country due to better price realized for higher fat and convenient disposal of animals at good price at slaughter house which is not possible in case of cows due to government ban in most of the states.

The farm gate price in India is still better than most of the country wherein half of the milk gets sold at around \$0.35-\$0.40 for cow milk and rest half at above \$0.55 for buffalo milk. Milk production in India has a high level of polarization with half of the states producing 90 % of the milk, 87% of the breedable cattle and 98 % of the fodder resources.

Indian dairy industry is passing through an interesting phase. On one hand the organized sector is becoming more responsive towards farmers through implementation of appropriate extension services for animal health, clean milk production, breeding and balanced rationing at cooperative societies level. On other hand the government is launching an all-inclusive drive to ensure micro finance, micro services, services, micro marketing and micro skill development at small and marginal farmers levels. The state government are becoming more active in reaching out to the farmers and launching a plethora of schemes and programs to ensure vaccination, deworming, artificial insemination, cow shelters, animal purchase, clean milk production, women empowerment, bio gas plants, community radio, fodder seeds, balanced ration, animal productivity, indigenous breed conservation and many more areas.

In India the total collection by cooperatives in first three quarters of 2015-16 crossed 4 crores* liters per day mark (* 1 crore is 10 million). This accounts for close to 10 % of the total milk produced in the country per day. An almost equivalent quantity got collected by the private sector in organized sector during the same period. This way the organized sector actually accounts for 20% of total milk produced. However if we compare it with the available surplus milk that is marketable at farm gate (surplus after captive consumption of the farmer family and being sold to the neighbors and villagers) this percentage rises to an impressive 40 % plus.

As per FSSAI records India has a total registered infrastructure of 25 crore liters per day at central level and 8 crore liter at state level thus making it around 33 crore liters per day at the national level in 28 states. The total infrastructure for processing is considered to be around 14 crore liters which is expanding very fast.

As per another study by NSSO ,44% of the rural household own bovine animals and for progressive states like Rajasthan (11%), Punjab (15%), Haryana (15%),Gujarat (18%), AP (20%), Kerala (22%) and Tamilnadu (25%) the percentage of household with dairy as a main source of livelihood is shown in brackets. In another survey out of 30% of the women in rural households who have free time , 20% or 10 million in numbers have shown interest in opting for dairying as an activity provided they are given all supports in terms of training, finance and appropriate market linkage.

With more and more rural households shifting their focus towards dairying as an opportunity in certain states, there has been a counter mechanism of people getting out of it in other. Urbanization or rather sub urbanization and very high growth rate of services sector could be treated as the major reason for such decline in work force for agriculture and dairying sector.

There has been a complex scenario arising out of multiple factors like low animal productivity, high input costs, poor management skill, high patronage of intermediaries on supply chain, poor cold chain infrastructure, poor power uptime in rural India, absence of regulatory at primary production level (for breeding, use of antibiotics and hormones, use of neutralisers) , poor financial inclusion for loans and cattle insurance, skewed scientific management of cattle policy for culling on one hand and high market demands, emerging consumerism towards safe and pure milk, high demand for protein rich foods, improved socio economic conditions, boom of service class, responsive behaviour of youth towards dairy entrepreneurship, etc. on the other hand.

So, let us look at the key factors controlling sustainability of dairy business in India and especially how do they reflect in Indian context for dairy farming.

3.1. Key Drivers to Sustainable Dairy Farming in India

There are three main pillars of sustainability of future dairy farming systems: Economic; Social and Environmental. The following section looks into the same and the policy support initiatives that support these factors:

a. Economic factors

Dairy farm economics is amongst the most important factors affecting sustainability of dairy farm business anywhere in the world. In India we have four major dairy farm models to be looked into. They are described as follows :

Sustainability of Indian Dairy Farming Systems

1. Small And Marginal Farmers : With Less Than 4-5 Animals

These farms contribute almost 75-80 percent of milk to the total dairy production of the country. They may not be the key contributor in terms of percentage of milk being sold in open market but in a large part of the country they are responsible for collection done under cooperatives as well as milk being sold to private intermediaries (in the areas where formal cooperative mechanism does not exist or is not efficient). Their major problem lies with high cost of feed and fodder, animal health and breeding services. They are also forced to maintain their unproductive as well as male stocks in case of cows due to government policies. Their other challenge being with finance for carrying out improvement or replacement stocks. Even after so many schemes from government for financial inclusion, they do not have access to formal financing as well as insurance facilities from the government agencies in most part of the country. Barring few states where local cooperatives have strong market linkages through out the states like in Gujarat, Rajasthan, Tamilnadu, Punjab, Madhya Pradesh, Karnataka, etc , these peasants get exploited by both private sector dairies as well as state federations for both pricing and payments. Some states like Karnataka is providing a substantial subsidy to these farmers to as high as Rs 7 but still we can not call that to be role model as it is a major impediment to the level playing field for all dairy players in the country. In nut shell these farmers are paying high cost of unawareness about the best practices as well as available schemes and their rights to avail the same.

2. Affluent farmers family farmers : with 8-10 animals

This is a comparatively less challenged category as dairying is not the chief source of income for them. In some of the states these affluent families or so called local land lords consider selling milk as taboo. However they are also major contributor to local private players as well as cooperatives. Some of them also sell their milk in local markets to the rural consumers as the ratio of milk producer to milk consumer in rural India is considered to be 1:2. They have different kind of challenges in terms of getting right guidance to scale up their operations, keeping their future generations opting for this business, poor animal health conditions and breeding services as well as pressure from the family to move out of this and limit the business to captive production level only. With more and more of the family members of this group getting educated and moving to urban areas for service or establishing some small businesses this group is under high pressure of either closing down or scaling down the business. Only those families wherein some family member (particularly lady at home) has taken lead and ownership of this business or the families having fixed sale of their milk at good price in surrounding areas that we find their business moving on to next scale. Normally such models are on buffaloes based farming or cross bred rather than indigenous cows.

3. First level commercial dairy farmers including peri urban farms : with 20-60 animals

This category is one which is expanding and needing formal intervention by all stakeholders. They are much aware farmers and understand the basic economics related to farming business. They are not much dependant on supplies of feed and fodder from their own farms in some cases and have developed supply chain with various suppliers for hay, dry fodder, concentrate, industrial edible waste, agro waste etc from processed food industry etc. Those with buffaloes normally do not believe much in rearing the buffaloes but have established channel for buffalo replacement as and when the animal gets dry. Those with cows have established network with Indian sweet makers particularly at the times of festivals. This category has a regional footprint and the practices are more or less accustomed as per the local demand. Say in case of Bikaner the whole supplies with these players is to feed largest rasogolla cluster of the world and probably the buyer of this product is one of the benchmark in India for purchasing and pricing milk on protein basis (or channa yield basis). On the other side say in central India say at Deoria which is Bihar and UP border district the purchase is more on panir yield of milk getting maximum price which is again protein plus fat based.

4. Commercial dairy farms : with more than 60 animals reared and managed scientifically

These categories of players are getting maximum coverage now a day in media and they are the one who are actually bringing a paradigm shift in Indian dairy farming sector. These players have a bi polar characteristics. One of them are traditional land lord farmers who have graduated to a level of commercial dairy farming through scaling up, networking, integration and expansion. The other category is a first generation farmers with highly diversified background covering IT, Real estate, banking, engineering, retired senior government employees, ex service man, SMEs and large corporates. A couple of them have been from a modest rural background also without any dairy background , like the one enrolled with various state government schemes like Kamdhenu in Uttar Pradesh. Though they have been showcased the most on media and social media but still success stories about their long term sustainability is still missing. There has been some spark in the overall performance of these players in terms of sustainability for those who have been in the sector for last more than 3-4 years. Bhagya Laxmi farms at Manchar, Sharda Farms at Nasik, Binsar Farms at Kundli, O'leche in western UP, Rajdarbar farms near Alwar are few of the success stories which have not only developed a strong market linkage but also got control over their volatile farm indices in terms of intercalving period, mortality rate, mastitis cases, age at first calving and AI success rate , etc.

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In terms of input costs while labour and feed may not be too challenging in first two types but productivity and feed conversion into milk, animal health and breeding is a big challenge.

On the other side if the farmer himself is involved in third and fourth case (one of our research study found that more than half of the commercial dairy farmers take the responsibility of training their employees for farm related activities) then labour skill development and at times feed and fodder (provided they depend upon green fodder and concentrate) is also not a great challenge. However sudden collapse of farm performance indices, feed conversion, productivity, technology failure, disease outbreak like brucellosis or mastitis, poor animal purchase, reproductive failures, disposal of male calves and unproductive animals, high cost of supply chain for milk delivery (for door to door delivery), high cost of production for meeting regulatory standards in case of states like Haryana and Punjab in particular (Cow milk standard is 4% fat and 8.5% snf which is very difficult to achieve with HF cross breed), may be the true pain points.

We can not measure the economics of these farms using the same yard stick. All these farms have different kinds of challenges and opportunities. At the end we would be recommending important areas for these farms to put their focus on in order to be sustainable.

b. Social factors

"Delhi-NCR, which consumes almost 80 lakh liters of milk every day, is becoming a hub of modern, integrated dairy farms with their own cows, modern cowsheds with fans and sprinklers, milk parlors, vet clinic and milk-processing facilities.

"There is adulterated milk in the market. We wanted to provide people pure, farm-fresh milk. Besides, I get to spend time in a rural area, away from Delhi's pollution," says one of the Delhi's cowboy, sitting at his farm, with cows mooing in the background. The region has many other dairy farms run by engineers and management professionals, many of whom quit their plush jobs to become milkmen."

Above two paragraphs have been taken out from a feature which appeared in The Hindustan Times Delhi on September 10th 2016 titled as "Delhi's new cowboys: Engineering a new milk revolution".

A silver lining exists with a large number of educated and highly qualified groups of entrepreneurs venturing into commercial dairy farming. Currently such trend is seen across India but around metros and mini metros. There have been a number of success stories appearing in the media about these farms but still high cost of production for feed and fodder, labour and distribution are the key challenges being faced by these first generation professional farmers. One of the success story is shared with you all as follows. This is a story about Binsar Farms which is located at Delhi- Haryana

border. This case study elaborates on how computer professionals could actually bring sustainability to a dairy farm business by following the cardinal rule of dairy farm sector i.e. Record, Record and Record. This is how USA increased the average productivity of their Holstein Friesian from a paltry 2000 litres per lactation in 1920 to 20000 LPD in 2020. These engineers developed their own forecasting model on all relevant indices on farm economics as well as they themselves got their hands dirty by being at farm 24/7 for last almost 4 years now.

Binsar Farm: A Sustainable Approach

Story begun with reunion of three computer engineers in summers of 2009, they decided to trek into doodhatoli forest range of Uttaranchal - interestingly "doodhatoli" means "bowl of milk". And likely so as this forest become resort for herdsmen and shepherds of Uttaranchal during summers, even during those days grass is green on pastures of forest. Binsar is an ancient grand Shiva temple in the middle of forest. It look like a celestial plan as team then did not had any clue that one day they will be embark on herd and milk. Binsar in colloquial hilly dialect also mean "The Dawn".

They were greeted by a kind *goatherd* who offered his hut to spend the night, when lost their way during descent; Overnight talk went in discussion ended with challenge that he threw on to them,





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refused to take any support he said “you people just talk social, you can’t walk the talk once back to city and jobs”, at the dawn next day he politely directed them to right path.

Humbled by the hospitality and erupted by the challenge, trio now decided to give back to communities; Pankaj hailing from same region took responsibility to chart plan. Knowing city people value lentils, fruits, grains from the region, Initial thought was to pick up lentils from the hills and sell in the plains forming small village level cooperative groups helping local to raise their incomes. All this needed local leaders and logistical framework, which was difficult to organize without government and non-government support. Unfortunately, 2011 being election year, what happened was not unusual for Indian society - they got in trap of local leaders with political ambitions, post-election. Who later went back on their words?

Distressed by the typical fortune hunter mind set of local leaders, group started looking for leaders and domain experts worldwide. There too everyone was only focused on commercial proposition without taking any risk or ownership. It was Mr. Earl Rattary who understood the yearning joined hand with group; Dream was now propelled with the support of Earl and his expertise, team spent next one year in modeling business and planning execution;

Earl made team realize that unless they are not commercial success, they are not eligible for the social dream, he gave reference from his experience that grant, subsidies and superficial help can never support any person or profession. He said, most of the people need leadership and believe “that they can do it”. Unless they find example of a credible commercial model they do not believe it. He suggested that *“getting to a leadership and respectable position should be the first target for the venture. Cannot be achieved without being profitable”*.

Finally, in 2012, team started its on ground beginning with a small “Proof of Concept” setup, In India, where people begin with milking cows they begin with 50-heifer, those are yet to take 1year to produce any milk, though, initial setup was temporary, it helped them to build team and competency. Accordingly to them, three heifer casualties in first three week of operation and entire first season maize crop going to insects initially tested their courage. Everyone around village witnessed how three engineers and one foreign guy has fought challenges and off late started winning their battels with god and odds. While Pankaj and Deepak was seeing and providing continuity on ground, Sukhvinder and Earl played a role in organizing finance and lending right governance to the business.

Binsar-Farms has recently found its patronage in consumers at Delhi and NCR homes, mainly these are families who want Farm Fresh milk directly supplied by their farms; their milk is getting popularity and wining customer with it is freshness and taste. Most of the time their customer are young and aware people.

Binsar-Farms has reached to end of the beginning phase and now preparing for aligning with other commercial dairy farmers and fodder farmers, ensuring them year-round income so that they can plan future and build resource in their younger ones; Social dream once seen, today, just begun to deliver in reality.

On other hand we would like to share another case of state government promoted dairy entrepreneurship scheme. In 2013 the state of Uttar Pradesh (the largest milk producing state) started with an ambitious target of having 425 farms with 100 animals and 2500 new farms with 25 and 50 animals by launching a prestigious dairy entrepreneurship scheme. It is another case worth mentioning in the context of farm sustainability in India. The scheme which started almost 3 years back has a large number of such farms either at the verge of closure or struggling miserably due to lack of appropriate knowledge about animal rearing, feed and fodder, animal health and breeding on one hand and a non existent market linkage with better price realization for such farmers. The poor farmer who got enrolled in this scheme did not have enough of financial support to run the farm during the lean period or plan his dairy for regular and high milk production through synchronisation of breeding due to lack of knowledge. The government dairies as well as private dairies in the state are exploiting them by paying prices at par with a small and marginal farmer. One of the major reason for failure of such scheme lies with short sightedness of policy makers at times. Though the scheme on its own is very impressive and offers 100 % interest waiver on 75 % term loan but it does not provide a robust eco system to support the business at entity level. This program would have become a great success had there been a differential pricing policy for the milk produced by these farmers considering the high quality and quantity of milk to be produced at a commercial dairy farm. Even in our neighbouring country Pakistan there has been a differential pricing mechanism for commercial dairy farmers producing more than 50 litres per day and such mechanism is well patronised by global leader by Nestle. The government should also have provided free services for farmers for good breeding practices and balanced ration with feed and fodder management. The farmers should have been provided with high quality compound feed at reasonable prices. The state government could have created a special brand for them, under their state run dairy federation so as to get them a premium pricing. Though the socio cultural contours of India are changing. The consumer is also ready to pay high price for fresh farm pure milk but the supporting infrastructure to harvest the opportunity in the country is still not made available to everyone at large. Thus looking at both the models we find that sustainability is a function of appropriate knowledge to manage the farm and above all strong market linkages with high realisation than just providing some financial investment to enter into this business.

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c. Environmental factors

Dairy industry has a great impact on poverty alleviation and providing nutrition to all strata of society. As per an ex chairperson NDDDB, Mr Nand Kumar *“Many of these hungry and under-nourished population live in the rural and backward areas, and milk as a provider of nutrition and dairying as a provider of employment and income have to be recognized as effective development interventions in the context of prosperity of the rural and backward areas.”*

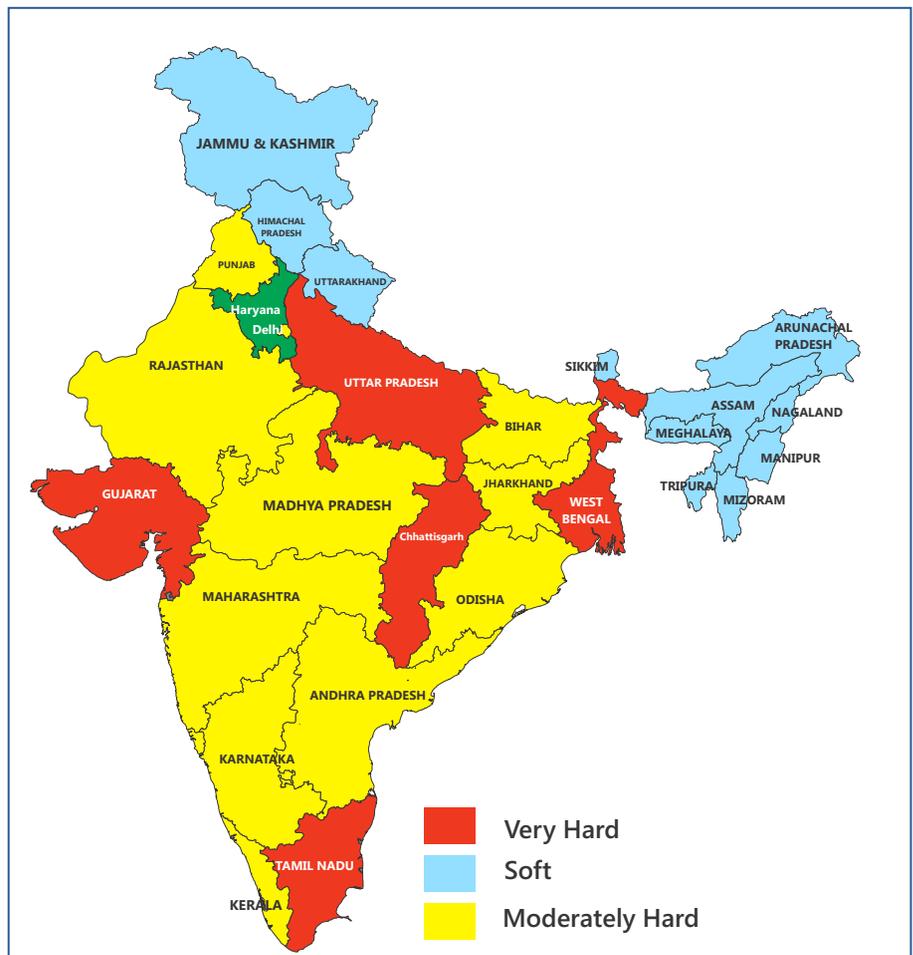
There is a requirement of promoting dairy as a business at small and marginal farmer level irrespective of their capacity to sustain on their own or not to at least provide them an opportunity to meet the nutritional requirements of their families and particularly for children under 5 (who are around 39% of the total population being considered as malnourished in India), otherwise these families might undergo nutritional insecurity due to lack of milk in their diets. Such a vast outreach demand for making these farmers aware about best milk practices and making dairy farming business sustainable for them requires a huge force of community resource persons who would then be not only making these farmers sustainable but would earn a decent earning for their families too by providing various services like AI, balanced ration kits, mineral mixtures, low cost compound feed, feed, medicines etc.

All government initiatives for covering the whole eco system of small and marginal farmers through various schemes is most appropriate at first place. As most of these farmers have a holding of local Indigenous animals so National Gokul Mission and government programs for conserving local germ-plasm is commended and well acknowledged by the industry. Efforts must also be on setting up Bull and Semen stations of high pedigree and tracking and recording of bull performance across the country with the help of state government.

At times it is being said that the urbanization and large infrastructure projects including smart cities and highways are eating out the vast agricultural land banks and thus very less space is left for producing fodder. I think it is not relevant as even after all the urbanization and infrastructural projects in full swing, the total impact is not on more than 2% of the total land available for such purposes. We need to rather look at the possibilities of intensive as well as extensive farming practices for dairy fodder

production. A lot need to be done in setting up compound feed plants with mineral mixtures for better availability of these products at farmer level and particularly in regions and states having low potential for dairy as a primary agriculture activity. Almost half of the country may be considered as a target for such intervention. It is also relevant as the demand of milk is rising in all parts of the country irrespective of its milk potential or not.

Water foot print for milk is amongst the least when it comes to most of the nutritional food items in Kgs compared with 250 ml of milk. In most part of India as per the map shown below water is very hard or moderately hard. It is needless to say that water availability in most part of the country is another challenge. Poor availability of water also is one of the reason reasons for farmers offering less water to their animals and in general practice it is a farmer offering less water to their animals and in general practice it is offered twice a day. On other hand this hard water offered to animals as well as feeds increases the natural salt content levels of Sodium, Potassium and Magnesium in the milk produced. During our ongoing National Milk Survey we are also trying to logically reason out the high Sodium levels in milk arising out of neutralisers like





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baking soda and Caustic or from feed and water. Our National policy for milk productivity needs to be seen from the lens of quantity and quality of water available for available for better sustainability. High sodium content in milk and other primary agriculture produce is also a big challenge for medical reasons as it leads to high blood pressure and later kidney disorders.

There have been concepts like urban farming which actually takes care of healthy food requirements of urban population. There have been models wherein for every inhabitation of around 1000 population ,population, 2 acres of land with 80-100 animals and space for organic vegetable production could be considered . considered. In Smart cities such kind of interventions may well be conceived right in the beginning which would not only ensure green environment but safe and healthy foods also without increasing the power and fuel foot print of delivery supply chain/cold chain for such essential products. It would also keep the population close to nature in the emerging concrete jungle scenario.

Supporting Policy for Animal Health and Welfare

The Government of India has some robust programs to support state government in the areas of animal health, breeding, feeding, animal disease control and dairy development at large. Initiatives to control diseases like Brucellosis, Foot and Mouth diseases and Peste de petits (for goats and sheep). National Program for Bovine Breeding and Dairy Development (NPBBDD) takes care of breeding services, development of infrastructure for clean and quality milk production, procurement, processing and market linkages over and above providing inputs to dairy farmers and skill development at farmers levels. There is Rashtriya Gokul Mission to take care of conservation of pure indigenous cattle breeds. The government is trying to make use of front end front-end technologies like embryo transfer and Sexed semen for quicker genetic improvement in this category.

The Indian government recently announced the launch of two new programs — Biotech-KISAN (Krishi Innovation Science Application Network) and Cattle and Cattle Genomics.

These programs are going to bridge the gap between farmers and the Scientists and research Institute. We have large number of dairy

research institutions in the country and have patronage from the government as well as funding from foreign institutions. I do not know whether any study exist which has evaluated the commercialization index of the research and technology developed by these institutions. There are hardly any technologies which these institutions could proudly showcase as the one being disruptive. The industry is depending solely on the R&D capabilities of similar firms outside India for both in milk processing technology and animal production arenas. All commercial farms or scaled up dairy processing plants uses technology from abroad and hardly depends upon the immense knowledge pools of Indian scientists.

We also have National Dairy Plan I getting implemented in 18 states (currently 189 districts out of 427 districts in 14 states are under this scheme) with high milk production from 2012 to 2019. This is a flagship program getting executed by National Dairy Development Board with a budget of around 20000 crores. This program is developing a base of integrating Indian dairy industry through networking for the dissemination of dairy related knowledge at the last mile. The scheme also includes development of market linkages with scientific way of milk procurement, chilling and dairy cooperative development. The scheme has provisions for extension for balanced ration program, breed improvement and dairy skill development.

Department of animal husbandry ,husbandry, dairying and fisheries(fisheries (DAHDF) has also got dairy entrepreneurship scheme which provides subsidies up to 25 to 33.33% . NABARD as well as certain states have got their own schemes of subsidies on setting up farms, purchase of animals, aluminum cans, bulk milk coolers, purchase of milking machines and other hardware for clean milk production and market linkages.

Our policy on cattle imports is very robust and channelized through DAHDF. The disease protocol for imported germ-plasm is well defined and imported conventional semen, sexed semen, embryos can be imported for breed development following the well laid down protocols from the countries matching market access criteria under signed bilateral agreements.

3.2. Future Directions for Indian Dairy Farming

All the research findings primarily highlight the following challenges which Indian dairying faces today. We have tried to reflect upon various measures to be taken up by different stakeholders to meet up these challenges to ensure sustainability in dairy farming in India:

- a. **Financial Inclusion** at small and marginal farmer level. This has been a problem since independence. Rural Indian is still not out of shackles of money lenders and particularly in dairy



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business. The complete production of the farmer is booked at a forward low price by these middleman against payment of some petty advances. Even with Jan Dhan Yojana and other noteworthy initiatives, it is still a challenge for a rural person to get a loan. It is easier to get a loan for a tractor than for cows or buffaloes. The farmers are not provided with insurance for cattle at their door step and they have to use unfair means to get it done. This leads to either farmer also opting for unsafe milk supply practice by increasing the volume of milk by adding water or some other adulterants or getting indifferent to this business at large. The availability of pastures around villages is getting depleted due to encroachments by the local affluent group of people with political lineage. Once access to micro finance for dairy business is available, I think the farmer will find his own means for animal health, feed, fodder and breeding services in this increasing demand scenario for milk and milk products.

- b. Absence of required cold chain infrastructure** to manage quality and quantity of milk supplied with fragmented production base. This is a major reason why the competition in dairy could not be fair at any given time and particularly at the time of high demand. The intermediaries who remains dormant during flush becomes active during lean and festival time and openly supplies adulterated milk so as to meet the two ends. FSSAI or the food regulator in the country are doing their bit but media is also fuelling the fire due to their vested interest in TRP ratings rather than safe milk.
- c. Most of the cash subsidies** are on hardware like animals, milking machines, aluminum cans, etc in almost all the states under various programs but there is no subsidy on production, productivity or quality of milk. Such subsidies are mismanaged also as the government infrastructure believes in number of beneficiaries and there are hardly any impact studies available for such disbursements. However one of the states has a subsidy on milk produced but that is disturbing the level playing field environment for private versus cooperatives.
- d. Skill development** on dairy farming practices at all levels is missing and most of the time one size for all strategy is getting implemented. India has a diverse agri background and before launching any such program the country needs to be analyzed using our 5-I program which we shared in our Dairy vision 2030 document (2014). 5 I stand for Identification of animals, farm and farmers. Inventorization of best practices used by farmers, Integration of clusters using the similar practices within a region, Institutionalization of all relevant activities under one program and lastly designing and directing all Investments to reach the last mile with a cluster specific theme. We can see a lot of things falling in place since 2011 with

government focusing on identification of animals and in one of the state Aadhar cards for animals are getting issued. The rest of the steps might also make investment by the government and other stakeholders relevant in this sector.

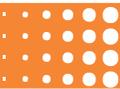


5 I Model for Dairy Development in India
By Suruchi Consultants © 2014

- e. Absence of Scientific management of animals** is not the major problem but challenge lies in what we are doing for disposal of unproductive, sick animals and male calves. One of the states has recently launched some program to support Gaushala to make them sustainable. Such efforts are appreciable but it would take a long time before any positive result might come. By that time the poor farmers as well as animals might not survive the economic burden arising out of unproductivity and high cost of survival. The transportation of animals in any manner is not a simple process any more. There is a need to provide green corridor (notional) so that good quality animals could cross borders and reach the place of requirements. Replacement and rotation of animals is an essential activity for sustainability of dairy farm industry.
- f. Lack of Innovation** by the processors leads to dearth of opportunities for milk producer to add value to his milk. Most of the processors in private as well as cooperatives are still thriving on old product mix, distribution models, target segments, etc thereby leaving no space for milk farmers to get better value for their produce. The inefficient operations of the processor are another reason why we have been producing costly milk products out of low cost raw material. Emerging integrated farm players are doing their bit by reaching out

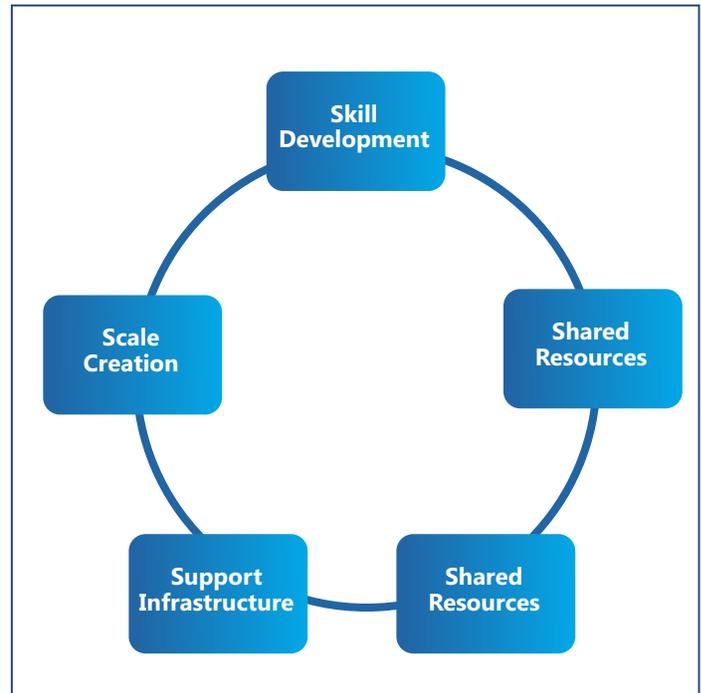


Sustainability of Indian Dairy Farming Systems



directly to consumer with their high quality fresh pure milk and charging high prices (which they are getting also). There is complete lack of innovation and R&D in dairy sector in India which is leading to a situation where both private and cooperative sectors in most part of the country are unable to pay true worth of milk produced by the farmers.

- g. **Poor genetic potential** is something which we have been watching with closed eyes for so many decades now. Suddenly there has been upsurge in number of initiatives and schemes for conservation and improvement of our indigenous breeds of cows (say Gir and Sahiwal) and water buffaloes and their germ-plasm. This step is commendable but it must not be done at the cost of speed breakers for ongoing development of dairy farming projects (both at state and private sector levels) which cross bred exotic HF and Jersey germ-plasm with Sahiwal and other prominent Indian cows. Rather there should be a speed emphasis given to convert as many of our non descript crossed with HF and Jersey for pushing the average productive bottom up level.
- h. **In the space of learning** there is a need of collaborative process wherein the learned farmers need to disseminate their knowledge with the community of farmers around them. In our other model of 5S discussed in our joint publication with IFCN earlier on sustainable farm structure in India (2015), we talked about community inclusion for sustainable dairy development in India. It is a peer mentorship approach. Most of the commercial farms with good market linkage get stuck with their supplies at one point of time or other. This model helps them to not only co create an eco-system multiple farmers being attached to them of scale development but also to get the high-end technology and best practices reach the local farmers without any cost to government.



5 S Model for Community Inclusion
By Suruchi Consultants © 2014

4. Summary

Though, presently the dairy world is going through the worst dairy crisis in the last 10 years, the future of dairy development in the world is optimistic as per the IFCN Outlook scenarios 2025. Global per capita consumption will increase by 13 kg ME per year (127 kg per person). The highest increase in per capita consumption will take place in South Asia (+30%) up to 174 kg ME per person. **Trade of dairy products will gain further relevance.** This reflects the increasing importance of trade in the dairy world and the development of shifting dairy production to more competitive locations. **The dairy world will have new net importers and new net exporters.** In 2025, some countries will have changed their net trade status. While India and Iran are predicted to be net importers, thus demand exceeding production, EU-28, New Zealand, Belarus and Argentina will increase their net exports. There is a greater scope for India to harness its strengths in utilising the trade potential in the next 10 years.

Level of global milk supply will keep on growing and cover global demand. Milk production is expected to increase by 25%, up to 1038 mill t milk (ECM) in 2025. Half of the production growth is expected to take place in South Asia. **There will be 405 mill dairy animals in the world in 2025.** An additional driver for milk production growth is the milk yield per dairy animal. This is expected to increase by 14%, reaching an average of 2.5 t/ milk animal/ year. There is a greater opportunity for India to increase the milk productivity levels at a much faster pace to match with the global average standards.

There is predicted to be **fewer farms, but larger farm sizes in 2025.** In the next 10 years, the number of dairy farms will decrease to 103 mill, so fewer farms will produce a greater amount of milk. South Asia will lose 17% of its farms but increase its average milk yield by 31% per milk animal. Average world milk production per farm has been increasing by 16% in the last 10 years and it is expected to increase further by 47%. India could change the farm structure outlook further through faster structural changes and higher increases in milk productivity. Though presently most of the increase in milk production is already coming from the increase in milk yield. With huge shortages in feed requirement, increasing production through productivity will help to utilize scarce feed resources and also help in reaching the environment goals of green house gases.

2015 perspectives of production costs to decrease in USD terms is mainly found to be driven by currency devaluations and changes in farming systems which in turn is driven by newer and lower milk price equilibrium levels at about 41USD per 100 kg ECM. First estimation by IFCN for costs in 2015 show stable costs for USA and significant costs reduction of 5-9 USD in the EU, NZ, BR, PL.

Perspective on competitiveness of Indian milk production

Costs of milk production in 2015 in the typical farms analysed in Punjab, India is in the range of 35-47 USD per 100 kg ECM. World dairy competitiveness is getting more and more consolidated as the major countries are able to produce milk in the competitive range of 40-45 US-\$/ 100 kg ECM. This implies that the ability to maintain stability in volatile markets or adoption of innovative solutions to sustainable dairying is the key. There is very less price transmission between the global milk market and the Indian milk prices. This is mainly because of the protection of its market policy and the insulation from extreme volatility. With rapid economic development and rising salary levels, the competitiveness of the typical 2 cow household farming systems will continue to erode further. Hence, farm structural development and strategies to improve farm productivity needs to be worked out using the global knowledge and available resources rapidly.

Perspective on sustainable Indian Dairy Development and future directions: Indian Dairy 2.0

India has entered into its second version post demonetization. Demonetization reminds me of great insight from the book *The Alchemist* that says "Loss of fortunes is a common occurrence at the beginning of most quests." Indian dairy sector is now all set to come at par with developed world in terms of commercial transparency at all levels of integrated dairy operations.

A quick reflection on the current circumstances indicates at the following 5 changes which the Indian dairy industry could foresee in near future.

- a. It is a great opportunities for cooperatives and now for private sector also to make use of digital eco system for farmer's payment. Most of the key cooperatives have welcomed this idea. With Jan Dhan Yojana giving direct access to nearly 15.67 crores rural customers (as on Nov 9 2016) and 25 crores account in total, there is hardly going to be any trouble even for enrolling 7.2 crores dairy farmers in the country. Such initiative would instantly change the footprint of Indian non-cash transaction from a paltry 9% to surpass the BCG projected number of 59% before 2025.
- b. The companies will have to formulate strategy to be more responsible towards tax paid billing (particularly at unorganized sector level for products like paneer cheese, ghee and SMP) thereby creating a level playing field for responsible dairy operators as well as ensuring supply of pure and safe products at the consumer end. This would bring higher levels of transparency in the business and dairy would surely be moving up on the Integrity Index for doing business.



Summary

- b. The companies will have to formulate strategy to be more responsible towards tax paid billing (particularly at unorganized sector level for products like panir, cheese, ghee and SMP) thereby creating a level playing field for responsible dairy operators as well as ensuring supply of pure and safe products at the consumer end. This would bring higher levels of transparency in the business and dairy would surely be moving up on the Integrity Index for doing business.
 - c. The companies have a massive opportunity to explore or cross benchmark the Newspaper selling model for milk and milk products by enrolling a part of the consumers online for week/fortnight/month/quarter/half year/yearly subscription through online payments and later directing their supply chain to make delivery directly at the door step or at a convenient location near to their home. The cash transaction pressure both at the retail point as well as at the consumer level would thus be reduced to a minimal level. The customer is also getting ready for such opportunities at least for the essential products like milk. Thanks to Mother dairy booth near my house, which till date, has been supportive for supplies of milk, fruits and vegetables and other standard groceries to me and my neighbor by receiving old notes.
 - d. Such booking in advance would strengthen the working capital structure of most of the dairies (look at the news article in our dairy pulse newsletter where dairy industry is shown under stress with high working capital requirements).
 - e. Dairy has been a favorite investment opportunity for Private equity and Venture capitalist but due to propensity of higher cash transactions raises their eyebrows and they become selective and extremely precautious while evaluating dairy sector. Shifting of majority of business to non-cash transaction would make these funds to invest in dairy more aggressively and thus I could see a great time ahead for expansion, product innovation and new models of business along with foreign brands flowing in India along with huge FDI in dairy soon.
- In conclusion I would like to share the following table as a pragmatic approach in mitigating the challenges by focusing on critical success factors.
- Apparently with GST coming as a next revolutionary stem in Indian economy after Demonetization, Indian dairy industry is all set for a grand makeover and soon with lots of investments and FDIs in place we hope to have Sustainability in Dairy farms to not to be considered as a myth anymore.

S.No.	Farm Type	Key Challenge	Critical Success factor
1.	Small and Marginal Farmers With Less Than 4-5 Animals	<ul style="list-style-type: none"> ● Lack of knowledge ● Poor awareness on Farm economics ● Dependence on intermediaries and quacks for their key requirements related to animal health, breeding and sales of milk. ● Lack of access to finance for their micro requirements of money for animal rearing. 	<ul style="list-style-type: none"> ● Becoming part of Cooperative Society. ● Enrolling in Bank transaction through Jan Dhan Yojana. ● Actively participate in dairy extension programs of Cooperatives
2.	Affluent farmers/ Family Farmers with 8-10 Animals	<ul style="list-style-type: none"> ● Lack of knowledge ● Poor awareness on Farm economics ● Dependence on intermediaries and quacks for their key requirements related to animal health, breeding and sales of milk. ● Partial knowledge about Feed but not nutrition 	<ul style="list-style-type: none"> ● Form a cooperative society or become part of some existing one. ● Look for scale and look for opportunities to work in PPP mode with an SPV to process milk into products for value addition. ● Work on balanced ration and breeding techniques to gain economies of scale. ● Increase herd strength to gain scale fast.
3.	First level commercial dairy farmers including peri urban farms with 20-60 Animals	<ul style="list-style-type: none"> ● Dependencies on feed and fodder with informal sector. ● Animal rearing is a challenge and keeping large unproductive herd is not possible. ● Clean milk production is lacking Market linkage is controlled by intermediaries or institutional sales. ● Animal records and herd management indicators are the missing link 	<ul style="list-style-type: none"> ● Collaborate with Fodder seed experts and nutrition companies to get better feed to milk conversion. ● Consolidate demand and bargain during lean period from the suppliers. Jointly produce silage and hay to avoid lean season losses. ● Enroll under government's initiative on animal health and integrate with cow/buffalo breeding programs. ● Develop retail market linkages through setting up a mini processing plant as well as by appointing distributors of your products. ● Start looking at Cow hostel concepts and mobilize some resources along with government funding to establish these for taking care of unproductive animals. ● Star maintaining data of animals as well as operational data of the farm. ● Impart skill to the team and follow SOP for better farm management and lowering down of costs.
4.	Commercial Dairy Farms with more than 60 Animals reared and Managed Scientifically	<ul style="list-style-type: none"> ● High cost of assets due to proximity to big cities/towns ● Higher overheads ● Scaling up is a challenge beyond a certain point ● Feed and fodder procurement and logistics are a big cost. ● Higher working capital requirements for developing own sources of silage, hay, cattle feed etc. ● Cost of delivery is high from door to door ● High volatility of demand due to social dynamics of target consumers ● Turnover of skilled manpower is a big issue including poaching by other farms. 	<ul style="list-style-type: none"> ● Try to get extra land on lease than buying out. ● Collaborate with community around for scaling up and share your best practices for sustainability. ● Record all best practices on both offline and online format and benchmark all important performance indicators based on your best performance to begin with and then maintain the same. ● Develop training and skill development as the main part of your operations and develop farm personals at local level. ● Promote multi skilling. ● Collaborate with large feed/fodder/silage suppliers and schedule your delivery on Just in Time basis if possible thereby reducing the inventory levels. ● Enroll consumers through online mode and get the payment in advance as much as possible. ● Make use of digital world to forecast the same by giving opportunity to consumers to inform you in advance about their unavailability for any reason. ● Contact bank for better working capital terms. ● Collaborate with Feed nutritive companies to ensure stable feed to milk conversion at an economical price.

5. Annex

About IFCN



Dairy Data • Knowledge • Inspiration

IFCN is the global dairy research network. By addressing challenges in the dairy world, IFCN can contribute to a more resilient and more sustainable future for all of us.

What does IFCN do?

IFCN provides globally comparable dairy data, outstanding knowledge and inspiration to widen your imagination. IFCN creates a better understanding of the global dairy world. The IFCN - International Farm Comparison Network - started in 2000 with the basics - the cow and the dairy farmer. Step by step we deepen and widen the knowledge base every year. The knowledge creation is done via a network of dairy researchers from over 90 countries contributing to our annual processes, managed by the IFCN Dairy Research Center Centre with currently 15 dairy researchers. The IFCN economic models and standards ensure comparability between countries and provide a global picture. More than 100 dairy related companies and organisations support the IFCN and use the knowledge to better solve challenges in the dairy world.

IFCN has innovative ways to share the knowledge with its members and with the dairy world as a whole. The IFCN events are a key element in developing the network spirit.

Analysing the Dairy World using the Typical Farm Approach

In the IFCN, a typical farm represents a certain production system, farm size, production technology used and the related milk volume in a country/dairy region (HEMME 2000). The goal is to have at least two (and up to six) typical farms for each region. The first farm is an average sized farm with an average management performance. The second farm is larger than the first one but also having an average management performance, to show economies of scale. The key issue in creating high quality farm comparison results is to apply a uniform method to all farms. For further details please contact us at info@ifcndairy.org or visit us at www.ifcndairy.org

World Dairy Map 2016

The World Dairy Map 2016 shows us the dairy economic results of the Dairy Report 2015 representing 98% of the world milk production volume. The map gives us an overview of the major economic parameters like milk price, feed price, margin over compound feed costs and cost of milk production at monthly and yearly intervals since 2006. The information on the top 20 milk processors, milk production and milk delivered gives an overview of the dairy supply chain in the world.

IFCN Baseline Results and Outlook 2025

The IFCN Baseline is produced every year to show the most probable scenario of the Dairy World in the next 10 years and to show perspective guide line for dairy industries and all related business. The IFCN results for 2016 predicts that the world milk production will grow on an average of 2.4% reaching 1059 mill ton ECM in 2025. The highest milk production increase is expected in South Asia. It is likely that India and Pakistan may shift from self-sufficient situation to importer under existing conditions. The world milk demand is likely to grow at an average growth rate of 2.4% per annum meaning an additional 240 million ton of milk ECM to be produced by 2025. This demand growth is likely to be met by an average increase in herd productivity of 1.3% and animal population by 1%. The average farm size will show a rising trend from present 2.9 animals to 3.8 animals indicating decrease in farm numbers.

Annex

About Suruchi Consultants



Suruchi Consultants
Delivering solutions with integrity

Think Dairy



Suruchi Consultants is a research based dairy advisory organization serving the dairy industry since 1990. In 2005 Suruchi established Dairy Entrepreneurship Development center to nurture entrepreneurship through mentoring , capacity building and hand holding. Suruchi has conducted over 50 dairy entrepreneurship development programs in different parts of the country. Academy of Dairy Skill Development (AdSkid) was established in 2014 in collaboration with Indira Gandhi National Open University. This Academy is imparting one year Diploma in Dairy Technology to the aspirants and currently third batch of this course is going on.

Suruchi Consultants launched ThinkDairy brand to disseminate research based knowledge and insights for dairy industry with the dairy eco system in India and abroad. The know how is shared through publications, videos, podcasts and events and conferences. Since 2011 , Suruchi has published Dairy Industry vision 2020, Dairy Industry vision 2030 and a white paper on Sustainable dairy farm structure in India. Apart from published learning documents on how to set up a dairy farm and mini dairy plants, Thinkdairy has also dairy entrepreneurship development video series on its Dairyguru channel on youtube.

Suruchi Consultants is also supporting Food Safety and Standards Authority of India for conducting a National Milk Survey to understand the current status of milk adulteration in India. Simultaneously, Suruchi has launched Safe Milk Mission in which various training programs and awareness campaigns have been identified to enlighten, farmers, milk intermediaries, Processing plants and Consumers about Safe milk production and consumption. The objective is to get every Indian to get safe milk at its doorstep by 2020.

Suruchi is also conducting community development program by supporting farmers for clean milk production, balanced rationing, Animal health care and vaccination, Animal breeding and market linkages. Two such programs are undergoing at Dungarpur and Sikar districts of Rajasthan as a CSR initiative of DS Foundation (A Foundation from Dharampal Satyapal Group).

We at Suruchi Consultants acknowledge and endorse our Prime minster Sh Narendra Modi ji's dream project of skill development. In this regard AdSkid is designing programs for operators at Milk Chilling centers. Milk processing plant, Preventive maintenance, Quality control Laboratories and dairy farm management.

Since 2014 Suruchi is acting as a research partner with IFCN Germany and is developing future based models of typical dairy farms in India with a single objective of sustainability. The model is co evolved with Team IFCN by using research tools of IFCN and under the mentorship of experts from IFCN.

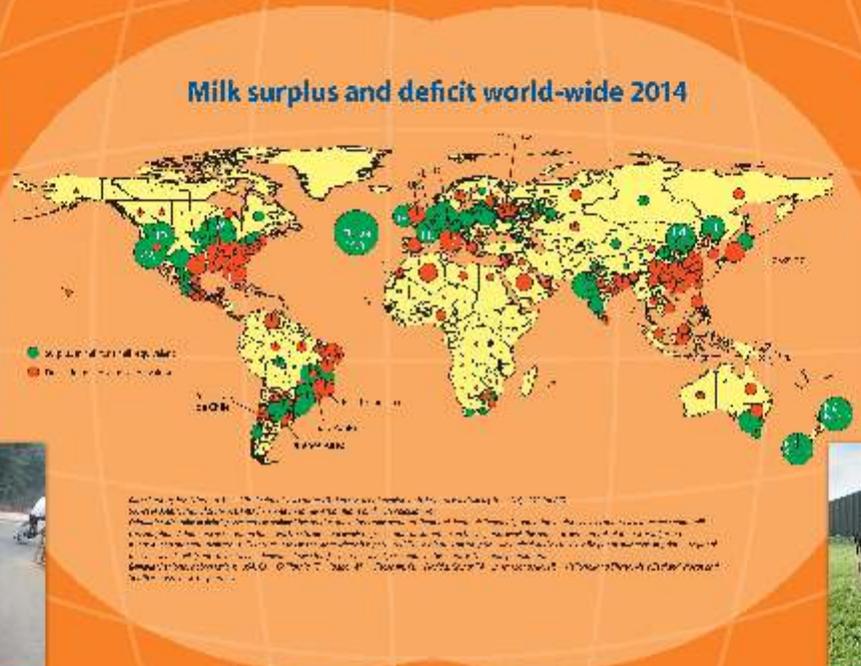
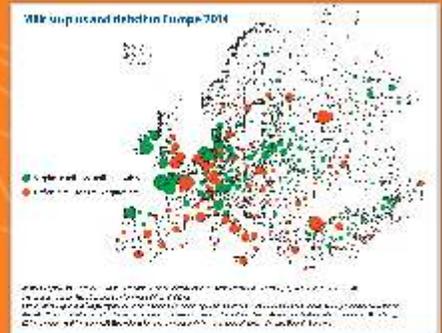
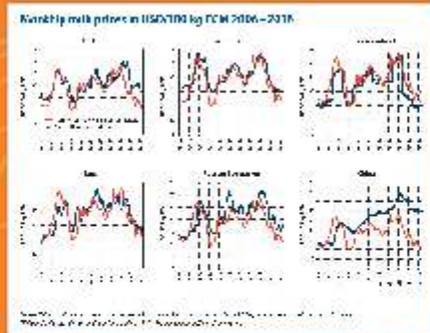
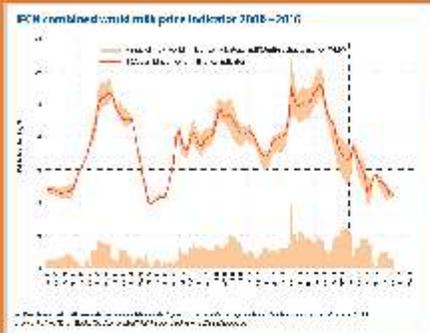
Suruchi Consultants is also known as one stop solution for complete EPC (Engineering, Procurement, Commissioning) solutions for setting up mini dairy farms and mini dairy plants in integrated as well as stand alone formats. Suruchi Consultants is also the first choice of Private Equity Funds and Investors for carrying out due diligence of existing manufacturing set ups for making wise decisions for a successful acquisition.



World Dairy Map 2016

Results of the IFCN Dairy Report 2015 – www.ifcndairy.org

For a better understanding of the dairy world



Sponsorship partners

Research partners / organisations participating

Institutional partners