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Trade, Agricultural Policies and Structural Changes in India's Agrifood System;  
Implications for National and Global Markets (TAPSIM)

**Project Brief on  
Prospects for EU-India Dairy**

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**Prospects of EU and Indian dairy: differential development in progress**

- **Milk production, processing and sales occur within global markets**

The EU is the largest milk producing region of the world, with 148 million tonnes (mt) of milk accounting for 21% of world production in 2009-10. The EU has a mature dairy industry, with about 90% of raw milk delivered to dairies for processing. Dairy production in India is growing rapidly, and represents two-thirds of the value of the output of the livestock sector, which in turn accounts for more than one fourth of agricultural growth domestic product, and which also provides employment to 21 million people. Whereas the EU exports throughout the world, India has become a major player in the Asia and ASEAN region.

- **Growth rates for production in stark contrast**

The production forecast for India is an evolution from 108.8 mt in 2009 to 131.6 mt in 2015, which is a compound annual growth rate (CAGR) of 3.2%; in the, in stark contrast, EU the evolution is likely to be from 147.0 to 149.8 mt over the same period (CGAR 0.3%). India will be leading the world dairy commodity production gains for both butter and SMP between 2009 and 2019, in terms of CGAR, and the EU will be declining. The EU will benefit from a positive CAGR for cheese, and maintain its position as the leading world producer, but the position of the EU will decline with regard to WMP. For 2020 India has an export potential of about 13mt of dairy products (measured in milk equivalents).

- **Policy frameworks have differentiated impacts**

The number of specialised dairy farm units in the EU has been steadily declining; and as yields of dairy cows has been steadily increasing in a situation with milk output being effectively constrained by quota, less and less cows are required to fill the quota. In India, public support focused on boosting supply capacity (Operation Flood) and the genetic attributes of livestock (National Project for Cattle and Buffalo Breeding) have encouraged the growth of total factor productivity for several decades.

- **Different stages in a similar trajectory for milk processing in EU and in India**

In the EU, dairy processing is shifting from cooperative operations to becoming consolidated in a few major industrial firms. In contrast, the success of the milk revolution in India is largely ascribed to the cooperative networks, which were instrumental in linking the smallholder milk producer to the markets. In the most recent period, nevertheless, steps of progressive deregulation (de-licencing) have been inciting private processing groups (including multi-nationals such as Nestlé and Danone) to set-up and/or expand their activity.

## 1. EU and India milk production of milk within their respective mutual and global perspectives

Milk production in the EU and India occurs within the framework of market forces operating on a global scale. Several animal species are sources for raw milk: in 2009 cow milk accounted for 84% of world production, buffalo milk 13%, goat milk 2.2%, sheep milk 1.3% and camel milk 0.2%, with a total production of 703 million tonnes. The use of different animal species is unevenly distributed across the world: in the EU cows are the primary source of raw milk, whereas in India buffaloes provide slightly more than cows (53.4% of the total output in 2009).

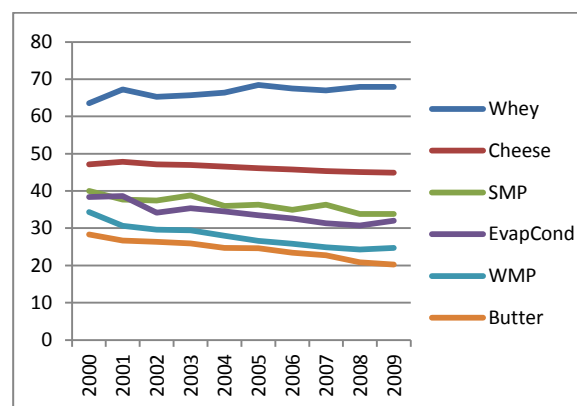
Raw milk is converted to a variety of products, the most important being drinking milk in both the EU and in India. The relative amounts of other dairy products, however, depend upon consumers' income and thus preferences and availability of storage facilities, deliveries to dairies and commercial structures for processing. In this respect, the EU and India have quite contrasting situations, as will be elaborated hereunder.

The contrast begins with the dynamism of their respective dairy production projections: the production forecast for India is an evolution from 108.8 mln t in 2009 to 131.6 mln t in 2015, which is a compound annual growth rate (CAGR) of 3.2%; in stark contrast, EU the evolution is likely to be from 147.0 to 149.8 mt over the same period (CGAR 0.3%). India will be leading the world dairy commodity production gains for both butter and SMP between 2009 and 2019, in terms of CGAR, and the EU will be declining. The EU will benefit from a positive CAGR for cheese, and maintain its position as the leading world producer, but the position of the EU will decline with regard to whole milk powder, and the forecast is that by 2019 it will produce only a third of that produced by the world leader, which will be China. India is not a major player in either of these commodity markets.

The EU has a mature dairy industry, with about 90% of raw milk delivered to dairies for processing; the percentage is somewhat less in the new Member States (in Eastern Europe) where a significant proportion of raw milk is still consumed on the farm. Ownership of dairy plants varies across the MS. In some farmer-owned cooperatives dominate processing of milk, while in others private companies take up the highest share. Distinct 'national' markets were once the norm – now

there is more cross-border ownership of farms and processing facilities.

**Figure 1: EU production of dairy products as a share of world production (per cent), 2000-2009**



The Indian dairy industry is undergoing rapid structural evolution, wherein the general basis is a low level of milk processing (25% of raw milk) and wherein nearly half of the milk produced is retained for household consumption, and less than one fifth of the milk passes through organized players (cooperatives and private players) and more than two thirds is handled by the traditional sector. This situation has to be considered in the perspective of an enormous increase in milk production since 1970, in which the CAGR reached a peak of around 6% in 1986-87, thanks to a concerted national effort to encourage and to organise production, Operation Flood, specifically through producers' cooperatives. Investments were made to strengthen the national milk grid in order to ensure a stable supply of milk to the consumers all through the year, with sufficiently attractive prices to the milk producers. Even in spite of strong population growth, per capita availability of milk doubled in the second half of the 20<sup>th</sup> century.

## 2. Dairy developments in the EU

The EU is the largest milk producer of the world, with 148 million tonnes of milk accounting for 21% of world production in 2009. With the quota system introduced in 1984, the EU has effectively stabilised milk production of the Member States. Whereas global production has been increasing steadily, the share of the EU has declined (see Figure 1).

Dairy farming is structured differently from Member State to Member State. Farm and dairy herd sizes vary enormously, as do yields (particularly following the May 2004 EU enlargement that brought ten new Member States into the EU). However, as the dairy

sector develops throughout the EU, so variations in yield and other technical factors are being reduced – less developed dairy producers are rapidly catching up with those who had restructured and modernised first. There is no 'typical' European dairy cow breed, though the Friesian-Holstein is the most prevalent.

The number of specialised dairy farm units has been steadily declining; and as yields of dairy cows has been steadily increasing in a situation with milk output being effectively constrained by quota, less and less cows are required to fill the quota. There were 30 million dairy cows within the EU in 2000 and 23 million in 2010 (statistics from all states now a part of the EU-27 combined).

In terms of technical attributes of dairy farming, costs of production in the EU-15 have varied more with regard to external factors than with regard to specific and non-specific costs<sup>1</sup> on-farm; in the EU-10 all types of costs have progressively increased since accession, but are not yet at the level of the EU-15 (with about a 20% difference in 2007, the most recent year in the time series available).

The costs associated with external factors for the EU-15 were on average €40/t, while in the EU-10 and EU-02 it was about half as large. The higher costs in the EU-15 are related to a relative increase in dependence on external factors, which is related to its large farm scale. Of the costs associated with the primary production, labour is an important item. The imputed family factor costs (family owned capital and family labour) in the EU-15 for the average dairy farm significantly declined over the period 2000-2007 (-26%), decreasing from €113.1/t to €83.9/t (the annual decline is €4.37/tonne). This is related to the increase in farm scale. In contrast, the imputed family costs in the EU-10 over the period 2004-2007 increased by 28%, from €53.9/t to €68.7/t (an annual increase of €4.82/t). The level of imputed family factor costs per unit of milk in EU-15 and EU-10 quickly converge over time.

The annual amount of milk deliveries to dairies in the EU is rather stable. Whereas protein content of milk is rather constant and uniform throughout the EU, this does not hold for fat. The fat content in the EU-15 is about

2% higher than in the EU-12. EU-15 production and consumption of drinking milk are rather stable. In the New Member States (EU-10 and EU-2), however, production and consumption have grown. The proportion of output of butter to that of drinking milk varies across Member State. Production of SMP is declining over time. This most likely reflects the shift in product mix, with the production of cheese expanding relative to that of butter and SMP. WMP production tends to decline, although production quantities fluctuate over years. This also reflects the relative increase in demand for high value added products (e.g. cheeses).

There are currently around 5000 dairy processors in the EU, of which about 55% is categorized as being small-sized (volume of raw milk processed less or equal to 5,000 t per annum) processors, 26% as medium-sized (volume of raw milk processed between 5,001 and 100,000 t), and 18% as large sized (volume of raw milk processed, 100,001 t or more). The degree of concentration shows a clear tendency to increase over time, indicating a continuous process of change towards consolidation.

In 14 out of the 27 EU Member States, over 50% of the milk is processed under cooperative arrangements. In many of the new MS, however, the role of cooperatives is limited. The biggest European milk processors were in 2009 among the top 20 biggest milk processors worldwide and covered 7% of the world production.

Because of the EU's Common Agricultural Policy (CAP) reforms, several of its agricultural sectors have become more competitive. However, the EU dairy sector is still not competitive at world market prices, although the recent and forthcoming EU dairy policy changes (transition from price support to a safety net provision, quota abolition) are increasing the market orientation of the EU dairy sector. The EU generally maintains relatively high import tariffs on dairy products in order to sustain the EU market price. There are only minimal imports at full tariff. Many of the EU's trading partners, however, benefit from special import arrangements – known as Tariff Rate Quotas (TRQs) – whereby imports can come in at lower tariffs. Some of the TRQs are specific to particular exporting countries; others are open to all under the most-favoured nation (MFN) system. TRQs are established for powders (SMP, WMP), different cheese types and butter. They are not always filled (i.e. fully utilised).

Projection for the period up to 2020 estimate that the rate of increase in milk production

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<sup>1</sup> Non-specific costs include those associated with machinery, building upkeep, energy (fuel, electricity), contract work, taxes (excluding milk super-levy) and other direct inputs (including water and insurance on farm buildings). Non-specific costs are relatively stable over time, and not considered to be influenced by domestic agricultural, or external trade, policy measures.

will be rather moderate. With EU-27 milk production projected to exceed the 2009 level by less than 4%. Milk deliveries would increase by a slightly higher rate (of almost 5%), the difference being due to the gradually declining on-farm consumption in the EU. The quota abolition is expected to lead to a very modest reaction of EU-27 milk deliveries at the end of the quota regime in 2015. Production of fresh dairy products (including drinking milk, cream, yoghurts, etc.) is projected to increase by 8% (from 2009 to 2020); cheese output is depicted to grow by about 10%. Prospects for cheese exports are favourable despite the strengthening of the euro, with the EU maintaining a steady share in global cheese exports above 30%.

### 3. Dairy developments in India

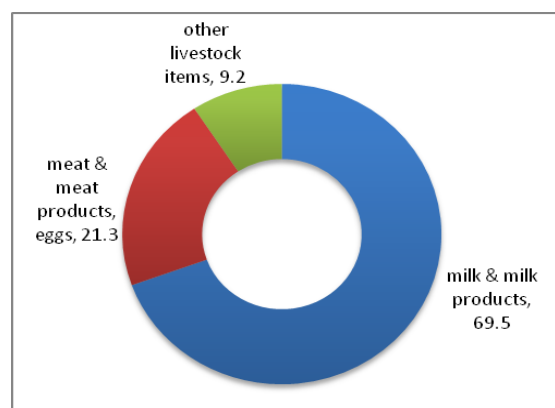
Livestock is an important subsector of agriculture in India; it accounts for more than one fourth of agricultural gross domestic product (2008-09); it provides employment to 21 million people, the majority being landless labourers, as well as marginal and small farmers. The livestock sector has been growing at faster rate than the crop sector and its contribution to agricultural economy has been increasing over time. As a key part of the livestock sector, India's dairy industry is largely traditional, local and informal. Smallholders, along with landless agricultural workers, dominate milk production. About 80% of raw milk comes from farms having only 2 to 5 cows/buffaloes.

Milk and milk products accounts for more than two thirds of the value of output of livestock products (Figure 2). Milk production in India increased from 17 million tonnes in 1950-51 to 116.2 million tonnes in 2010-11, and also per capita availability of milk increased from 124 grams per day to 263 grams per day during the above period. India emerged as the largest milk producing country in 1998 with a production of 74.1 million tonnes, overtaking the USA, and has continued to maintain its position. Among livestock commodities, milk and milk products are an important part of the Indian diet. The demand for milk and milk products has increased: their share in monthly per capita expenditure increased from 11.5 per cent in 1983 to 14.9 per cent in 2007-08 in rural areas and from 15.7 per cent to 18.4 per cent in urban areas during the same period.

Indian milk animals are historically low producing. Productivity of cattle in terms of milk yield is about half of the global average. The milk yield varies across breeds and

species and also across states. As expected buffaloes have a higher productivity as compared to indigenous cows, but crossbred cows score over both in milk yield. The milk yield of crossbred cattle, buffalo and nondescript cattle at national level were 6.9 kg/day, 4.6 kg/day and 2.1 kg/day respectively.

**Figure 2: Share of value of output of livestock by commodities in India**



Source: NAS, CSO, GoI, 2010

The increase in raw milk production is intricately linked to the improvement of the genetic attributes of the livestock, with breeding programmes carried out for both the milk cows and the buffaloes; the Government of India initiated the National Project for Cattle and Buffalo Breeding (NPCBB) in October 2000 to strengthen the coverage and efficacy of breeding services<sup>2</sup>.

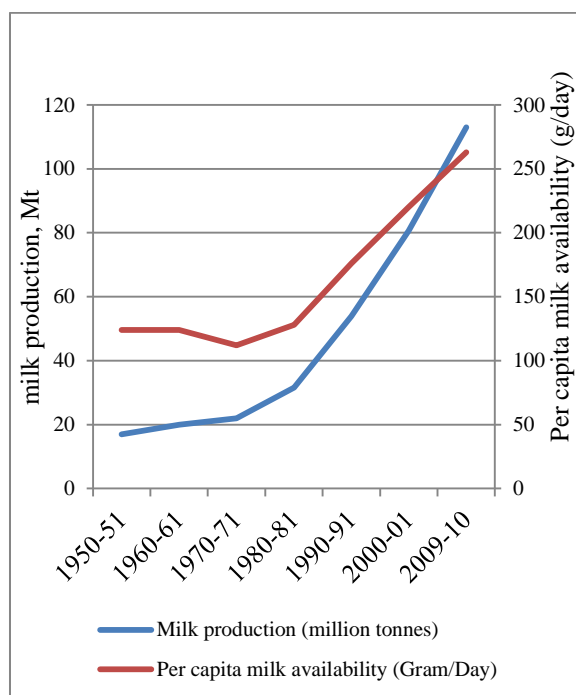
The improvement for cows has therefore been by crossbreeding of cattle races, and the share of crossbred cows increased from 5 per cent to 27 per cent during the period 1982 to 2007. The improvement of the buffalo stock was largely through the enlargement of the population of particularly productive races in substitution for other indigenous buffalo types. The development of the buffalo population in general has been actively encouraged, and the share of this animal among other bovine species has increased from 22 per cent in 1951 to 35 per cent in 2007. As a result, buffalo milk accounted for 55 per cent of the increased milk production and improvement in yield contributed to 41 per cent of this increase.

The demand for milk and milk products is projected to increase from 116 million t in

<sup>2</sup> In 2010, the government and the National Dairy Development Board have drawn up a National Dairy Plan amounting an investment of about USD 378 million and aimed at nearly doubling India's milk production by 2020.

2010 to about 140 mt. by 2020, thereby exerting pressure on boosting supply capacity even further than the enormous increase already achieved through Operation Flood from 1970 to 1996. It is important to keep in mind that total production of raw milk has been increasing steadily since 1970, and the rate of increase in production has improved further since 1980; this has obviously been mirrored in a corresponding increase in per capita milk availability, growing faster than the increase in population (Figure 3). Milk production in 2009-10 was 116 mt and increased to nearly 122 mt in 2010-11. The projected milk supply for 2020 is about 155 mt. For that year India has an estimated trade potential to export about 13 mt. of dairy products (m.e.)

**Figure 3: Production and availability of milk in India**



Source: BAHS (various issues)

The increase in the production of milk products comes in the first instance from increased raw milk production, but in the second instance from the improvement in the capacity to process the milk. There are three aspects to this improvement: first, organisational, through the encouragement of farmers' cooperatives; second, technical, through the focus on investments in processing equipment; third, fiscal, in the most recent period, with deregulation (de-licencing) inciting private processing groups (including multi-nationals such as Nestlé and Danone) to set-up and/or expand their activity.

The rapid growth in production and productivity of dairy animals could be attributed to adoption of technological change (including breeding programmes), better feeding and improvement in animal healthcare facilities. Total factor productivity grew at an accelerated rate after 1970-71 (1.4%/year). Cost of production as related to competitiveness is on a similar level with the EU when comparing large farms (0.27€/kg vs. 0.29€/kg of raw milk). Appropriate education and capacity development enable farmers to take advantage of emerging technologies and thus helps in raising milk productivity. A significant positive association between milk productivity and literacy suggests that education plays an important role in increasing milk yield, indicating the need for greater emphasis on human resource development as a means for enhancing the multiplier effect of a technology-led development of the Indian dairy sector.

The success of the milk revolution in India is largely ascribed to the cooperative networks, which were instrumental in linking the smallholder milk producer to the markets. However it must be noted that developing dairy cooperatives had the support of the government in funnelling international assistance and also protecting the cooperatives against market competition. This approach helped in establishing the cooperatives and thereby securing the livelihoods of millions of milk producers across the country. Alongside of the cooperatives, several private players, big or small, domestic or multinational, have entered the Indian dairy market, and it is predicted that these players have already outnumbered the cooperatives and instil greater competition in the Indian milk market. While India has a huge domestic demand to meet, it has also been exporting to neighbouring countries where food safety is not as a big issue as it is in the case of developed countries.

Economic development as a whole in India since 1991 has been related to a restructuring of the economy, in which liberalisation of trade has been a key element in stimulating the dairy sector through export growth. Exports of milk and milk products from India were earlier totally prohibited, but later on the exports of milk, baby milk and sterilized milk were permissible, subject to the licensing requirements. The export of powdered milk, prohibited earlier, was channelled through a regulatory agency, but was subsequently liberalised. Restrictions on butter exports had been similar to those for powdered milk but restrictions were removed



from March 2002. The export of ghee was subjected to quantitative restrictions in the 1980s, but has been progressively liberalised.

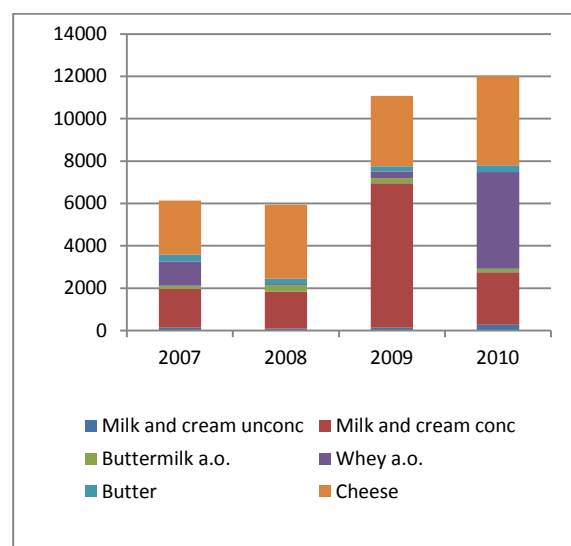
Presently, no minimum export price restriction exists for the export of dairy products. Sometimes India issues ad-hoc prohibitions on exports of sensitive products. For example, recently export prohibitions have been issued for export of milk powders when exports were banned in February 2007, but these were lifted in October 2007. In a similar way, import duties have been reduced since the early 1990's to a general level of 30% for dairy goods, exerting another pressure for being competitive against low cost commodities to satiate the growing consumer demand in India.

The key products traded (both exported and imported) are milk and cream (concentrated and containing sugar and sweetening matter), and butter, other fats and oil derived from milk and dairy spreads. While the two product groups together account for more than 80 per cent to 97 per cent of the milk products traded (except for a few years of import), the trends are somewhat mixed. Emerging market demand for cheese in India is reflected in the growing imports of cheese and curd (as one product group but largely cheese) of which also the EU benefits (see Figure 4). Imports of cheese and curd increased from USD 0.18 million in 1997-98 to USD 5.3 million in 2009-10. The share of cheese and curd in total imports of dairy products increased from 2.2 per cent to 7.7 per cent during the above period and touched a peak of 36 per cent in 2005-06. Also, in less than a decade, the share of cheese and curd in import of dairy products increased from 2.5 per cent to nearly 21 per cent. During this period, export of cheese increased from less than 2 per cent to almost 6 per cent. The Asia and ASEAN region (including Australia and New Zealand) is the key destination for export and imports of milk and milk products. The EU is a trade partner with India especially with regard to cheese, and the EU share of cheese imports has risen from virtually none (2-3%) in 1999 to slightly over 90% in a decade.

Despite being the largest producer of liquid milk, processing levels in India are low historically, in comparison to the quantity of production of raw milk, and this provides an opportunity to scale up activities in this sector. Trade in dairy commodities is subject to availability of excess milk, taking into account the rising domestic demand for milk and milk products. There is now perhaps greater opportunity for investments in dairy technology, food processing and the like that

can effectively contribute toward developing the Indian dairy sector with a focus on the processing and marketing of these products. Operation Flood was facilitated by external financial aid that helped create milk chains and link them to the markets. Today there is need for greater infusion of technology all along the value chain from production to processing and marketing. Opportunities for investment in dairy sector are immense, and partnership with foreign investors will be important.

**Figure 4: Export of dairy products from the EU to India (x €1000)**



Source: Comtrade and Comext database

For further information on the TAPSIM project, please visit [www.tapsim.eu](http://www.tapsim.eu) or contact [Floor.brouwer@wur.nl](mailto:Floor.brouwer@wur.nl). Project supported by the EU Commission, Directorate General Research. Scientific Officer: Hans Jörg Lutzeyer  
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