DAIRY GVC ANALYSIS
INDUSTRY-SPECIFIC GLOBAL VALUE CHAINS
READER PLEASE NOTE:

As the scope of the activity is purely to test the methodology for its relevance and applicability, rather than to inform ongoing operations or project design, breadth of study is prioritized over rigor and empirical evidence. Information relies on market intelligence, no firm conclusions are drawn and recommendations are indicative only; illustrating the type of insight that could be derived using the approach given appropriate time and resource.
1. **Strategic Segmentation** Slide 3

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**ANNEX: Segment by Segment Value Chain Analysis** Slide 144
1. STRATEGIC SEGMENTATION

INDUSTRY-SPECIFIC GLOBAL VALUE CHAINS
Through “Strategic Segmentation”, we have tried to answer questions (1) and (2)

1. What does the dairy industry consist of?
   What are the different “businesses” that exist in the industry?

2. What will the dairy industry consist of “tomorrow”?
   What trends are we seeing, in which direction is the industry heading?

3. What would it take to participate? To compete?
   What would it take for any country / region to compete in any one of the business segments that we have identified?

4. What would it take for COUNTRY X to participate?
   What do I have? What don’t I have? What policy needs to change? What investments need to be made?
Observable global industry trends

- Distinct user groups have emerged with different attitudes to food and nutrition
- Consumers in HICs typically have less time to prepare food and value pre-prepared, convenience varieties
- Limited shelf life increasingly associated with ‘healthy’ and can command a premium
- Increasing popularity of milk substitutes (and negative connotations associated with Dairy)
- Increased consolidation amongst dairy producers and processors
- Increased ‘globalization’ of industries and international susceptibility to economic shocks
- Climate change issues may impact sustainability of dairy farming in some regions
Distinct user groups have emerged with different attitudes to food and nutrition.

**THREE DISTINCT USER OR MARKET GROUPS** each with its distinct reasons for buying milk and dairy products.

1. **FOOD**
   Users who eat / buy food to stave off hunger and for basic nutrition

2. **NEUTRICEUTICALS**
   Users who eat / buy food for their nutriceutical properties

3. **LUXURY**
   Users who eat because they wish to indulge (and whose reasons for buying are entirely outside nutrition / nutraceutical reasons)
Distinct user groups have emerged with different attitudes to food and nutrition

**THREE DISTINCT USER OR MARKET GROUPS** each with its distinct reasons for buying milk and dairy products.

- **Different motivation for purchase** in each case means that each user group requires a different level of emphasis on marketing and branding.
- **Quality of offering** will change for each group of products as will the emphasis the need for traceability.
- **Farmer, processor and retailer** have differing emphases (and therefore bargaining power) in each case.

- **Implications for Dairy...**
Consumers in HICs typically have less time to prepare food and value pre-prepared, convenience varieties

In HICs, higher percentage of women working resulting in LESS TIME AVAILABLE TO PREPARE FOOD.

In 1984, 75% of suppers served at home were cooked at home. This percentage had fallen to 60% by 2014\(^1\).

“Assembling” but not fully preparing meals has become a popular trend among shoppers with consumers gravitating towards premade or value-added elements e.g. pre-chopped onions, grated cheese, pre-sliced apples.

Percentage of meals eaten at home that were prepared at home in the US

1984 - 2014
Consumers in HICs typically have less time to prepare food and value pre-prepared, convenience varieties.

In HICs, higher percentage of women working resulting in less time available to prepare food.

Increasing number of products for the “consumer-on-the-go”.

- Implications for Dairy...
Limited shelf-life increasingly associated with ‘healthy’ and can command a premium

Sustained public health campaigns have led to an **INCREASE IN HEALTH AND WELLNESS AWARENESS AMONGST CONSUMERS AND HAS AFFECTED SPENDING HABITS** (e.g. the demand for organic food & beverages is expected to reach USD 187.85Bn by 2019 compared to was valued at USD 70.70 billion in 2012\(^1\)).

Food with limited shelf-life (often referred to as ‘fresh’) continues to be considered premium or healthy vís-a-vís vis processed, frozen, canned or long life foods.

There is now increasing demand for non stockable products (i.e. limited shelf life) **WITH ATTRIBUTES / CONSTITUTION (E.G, VOLUME, FLAVOUR) THAT ARE REAL-TIME DEMAND DRIVEN**.
Limited shelf-life increasingly associated with ‘healthy’ and can command a premium

- Implications for Dairy...

Sustained public health campaigns have led to an **INCREASE IN HEALTH AND WELLNESS AWARENESS AMONGST CONSUMERS AND HAS AFFECTED SPENDING HABITS** (e.g. the demand for organic food & beverages is expected to reach USD 187.85Bn by 2019 compared to was valued at USD 70.70 billion in 2012¹).

Perishable food with limited shelf-life (often referred to as ‘fresh’) continues to be considered premium or healthy vis-a-vis vis processed, frozen, canned or long life foods.

There is now increasing demand for non stockable products (i.e. limited shelf life) with attributes / constitution (e.g, volume, flavour) that are real-time demand driven.

Dairy firms are increasingly required to provide a more sophisticated logistics + services mix.

“Frequency of Delivery” (specifically the capacity to make multiple deliveries during the day) has become just as significant to manufacturer’s offering as “Product Shelf Life” and is increasingly integral to the cold chain logistics.

Production facilities need to be flexible and nimble enough to response to real-time market demands hour-by-hour.
Increasing popularity of milk substitutes (and negative connotations associated with Dairy)

Dairy is becoming increasingly unfashionable in western diets as milk continues to be linked to health problems. Whilst the prevalence of LACTOSE INTOLERANCE is unlikely to have shifted greatly, awareness of the condition has increased greatly. Some estimates suggest that prevalence ranges from 5% in northern European communities to 90% in people of EAST ASIAN DESCENT\(^1\).

As a result, and in response to other environmental concerns associated with Dairy there has been a MARKED INCREASE IN THE PRODUCTION AND CONSUMPTION OF MILK ALTERNATIVES made from rice, almond, soy, coconut, hazelnut and other non-animal products. 2013 saw AN INCREASE OF 30% IN SALES OF MILK ALTERNATIVES PRODUCTS COMPARED WITH AN INCREASE OF JUST 1.8% ACROSS ENTIRE MILK CATEGORY\(^2\) and constituted 20% of the dairy sector in the US in 2014\(^3\). Growth in Almond Milk has been strongest.
Increasing popularity of milk substitutes (and negative connotations associated with Dairy)

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Dairy producers increasingly trying to differentiate product by producing dairy varieties that are:
- Low fat
- Fat-free
- Reduced sodium and sugar
- Lactose-free
- Organic
- Probiotic cultures, fortified with nutrients, calcium and protein

Increased competition leads to downward pressure on milk prices further reducing margins for processors and producers.

As differentiation is often at processor stage, bargaining power of producer (farmer) further reduced. Organic products are the exception.
Increased consolidation amongst dairy producers and processors

The world’s **TOP 10** dairy giants capture **24% OF THE MARKET** in 2014, up from **17% in 2009**.
The dominance of the “western end consumer” as the ideal target consumer may begin to wane. Increased consolidation amongst dairy producers and processors - Implications for Dairy

The world’s TOP 10 dairy giants capture 24% OF THE MARKET in 2014, up from 17% in 2009.

Large global producers will increasingly do what they can to a) create a market and b) build a presence in fast-growing emerging economies.

Large global producers will strive to strengthen existing presence in mature markets by focusing on smaller, more innovative ventures.

The dominance of the “western end consumer” as the ideal target consumer may begin to wane.
Increasing ‘globalization’ of dairy industry and international susceptibility to economic shocks

As can be seen from the graph, both THE PRICE AND THE FLUCTUATION OF MILK PRICES HAVE CONVERGED in recent years as the industry becomes more globalized and interdependent.

The exception is China whose farm gate remains relatively high and disconnected from the World Milk Price

Source: CLAL¹
Increasing ‘globalization’ of dairy industry and international susceptibility to economic shocks

- Implications for dairy...

The price and the fluctuation of milk prices have converged in recent years as the industry becomes more globalized and interdependent.

Downward pressure on milk prices further reducing margins for producers as they compete directly with international competition.

Global imbalances will create increasingly volatile dairy markets.
Environmental concerns may impact sustainability and structure of dairy farming

- **Dairy farming is resource-heavy and is often dependent on** HIGH CONSUMPTION OF FERTILIZER, POWER AND WATER\(^1\)

- **COWS EFFLUENT** has to be carefully managed so as not to affect the quality of waterways\(^1\)

- **Climate change may pose a threat to dairy farming in some regions as it increases the chances of** DROUGHT, FLOODS AND THE THREAT OF TROPICAL PESTS AND DISEASES\(^1\)

- **Other concerns include** GREENHOUSE GAS EMISSIONS across the value chains, BIODIVERSITY impacts and ANIMAL CARE\(^2\)
Environmental concerns may impact sustainability and structure of dairy farming

- Implications for dairy...

Pressure on dairy farmers to make ambitious commitments to improve farming practices and lessen the environmental impact of farming practices

Such commitments often increase overheads and overall cost of farming further squeezing margins

Some regions may have a limited future in dairy farming
Trends and tendencies were used to identify strategic segments (a function of both **products+services** and **users+markets**)

<table>
<thead>
<tr>
<th></th>
<th>Strategic Segment 1</th>
<th>Strategic Segment 2</th>
<th>Strategic Segment 3</th>
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<tbody>
<tr>
<td>products</td>
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<td></td>
<td>Strategic Segment 4</td>
<td>Strategic Segment 5</td>
<td>Strategic Segment 6</td>
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<tr>
<td></td>
<td>Strategic Segment 7</td>
<td>Strategic Segment 8</td>
<td>Strategic Segment 9</td>
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<td>?</td>
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</tbody>
</table>
Several iterations of the strategic segmentation were tested using Porter’s Five Forces...
For the segmentation to be valid, the P5F analysis for each segment must be different from the next...

Porter’s “5 Forces” assess the attractiveness of a given industry by analyzing **how profitable the segment is**, which actors have the most bargaining power and therefore **which actors retain the bulk of said profit**.
Finally, the iterative analysis resulted in the following segmentation:

<table>
<thead>
<tr>
<th>STORAGE TEMP</th>
<th>FOOD-DRIVEN</th>
<th>NUTRICEUTICAL-DRIVEN</th>
<th>INDULGENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>dry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>frozen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chilled</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Each strategic segment has its own distinct *ideal* value chain.

These *ideal* value chains are *not country specific*. 

**FREQUENCY OF DELIVERY**
- 1 - 3 weeks: chilled
- Once a day or more: Chilled

**STOCKABLE PRODUCTS**

**NON-STOCKABLE PRODUCTS**
2. DETERMINING THE IDEAL VALUE CHAIN FOR EACH SEGMENT

INDUSTRY-SPECIFIC GLOBAL VALUE CHAINS
Each segment was then iteratively assessed using three analytical tools.

1) **Advanced Buyer Purchase Criteria Assessment**
   This analytical tool focuses on the minimum requirements (quality, volume, price, safety, transparency, traceability, financial viability) that commercial buyers (both B2B and consumers) will accept.

2) **Generic Strategic Options**
   An assessment of generic strategic options identifies the advantages and disadvantages of targeting a Cost Leadership (no frills) strategy, a "Differentiation" (creating uniquely desirable products and services) or a "Focus" (offering a specialized service in a niche market).

3) **Key Success Factors for most innovative option**
   Key Success Factors are those characteristics that a company needs in order to compete well in a strategic segment.

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### Porter's Generic Strategic Options Tool

<table>
<thead>
<tr>
<th></th>
<th>Cost Focus</th>
<th>Cost Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of Delivery</td>
<td>Narrow</td>
<td>Broad</td>
</tr>
<tr>
<td>Dry</td>
<td>Business Seeks A Lower-Cost Advantage in A Small Number of Market Segments</td>
<td>Large-Scale Businesses Offering &quot;Standard&quot; Products</td>
</tr>
<tr>
<td>Chilled</td>
<td>Higher Production Costs and Extra Value-Added Features Provided for The Consumer</td>
<td></td>
</tr>
<tr>
<td>Chilled</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The analysis revealed four broad value chain ‘groups’ (1):

- Using an iterative process, the analysis revealed that although the value chain for each segment was different as anticipated, they could be grouped into four broad groups.

- The key attributes of the value chain within each group is very similar (though not exactly the same).

### Table of Value Chain Groups

<table>
<thead>
<tr>
<th>Storage Temp</th>
<th>Food-Driven</th>
<th>Nutriceutical-Driven</th>
<th>Indulgence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Frozen</td>
<td>A</td>
<td></td>
<td>A</td>
</tr>
<tr>
<td>1 - 3 weeks</td>
<td>A</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Once a day or more</td>
<td>B</td>
<td></td>
<td>D</td>
</tr>
</tbody>
</table>

See Annex for segment by segment analysis >>
The analysis revealed four broad value chain ‘groups’ (2)

- These groups can be loosely defined by their perishability, whether or not they can be sold at a premium and whether or not there is a global market for the product.

**A. Tradable (Stockable) Global**
This includes dairy products that can be internationally traded (usually due to their stockability or the fact that they can be made from milk powder). They are exemplified by those products that inform the Global Dairy Trade index. E.g. Whole milk powder, cheddar, lactose, butter milk powder, rennet casein.

**B. Perishable Non-Premium**
These are dairy goods produced and sold locally for which are consumers would be unwilling to pay a premium.

In HICs this might include ‘generic’ mass-produced fresh milk. In LICs this might include milk that is consumed directly by the farmer’s family and associates.

**C. Perishable Premium Global**
These are premium dairy brands that can be traded internationally despite their perishability due to brand recognition. Such products include Roquefort cheese (France), Parmigiano cheese (Italy), Haagen Dazs ice-cream (US, France ++)

**D. Perishable Premium Local**
These are perishable products that local consumers are willing to pay a premium for perhaps because of local flavor (e.g. Kefir), bias towards locally-produced products (e.g. artisan trend in US), desire for ‘freshness’ (e.g. rejection of preservatives/additives in California) or any other attribute property that increases local consumers’ willingness-to-pay.
• This includes dairy products that can be internationally traded (usually due to their stockability or the fact that they can be made from milk powder). They are exemplified by those products that inform the Global Dairy Trade index. E.g. Whole milk powder, cheddar, lactose, butter milk powder, rennet casein.

• The product is very difficult to differentiate and competition is global, therefore milk prices are low, vulnerable and volatile. Processors have a lot of power vis-à-vis farmers and retain much more of the value.

• Key success factors in these segments include the ability to produce high volumes of consistent, high fat-content milk per day (~100,000 litres) with access to sufficient, high-quality, and inexpensive feed and feed additives.

• These segments are dominated by very large producers as success in this group of segments generally requires access to global markets, ability to negotiate local/national/regional supply agreements, advertising/branding prowess and world-class risk management strategies.

• World-class, efficient, low-cost logistics (e.g. collection, distribution, freight forwarding) are essential and may include cold chain logistics (for cheddar, butter, ice-cream etc).
Ideal Value Chain Structure – A. Tradable, Stockable, Global (cont…)

- **LOCAL** (<1 day by road)
  - MILK PRODUCTION
  - VET SERVICES
  - MACHINERY MAINT’CE
  - COLLECTION SERVICES
  - PROCESSING

- **NATIONAL** (2-3 days by road)
  - QUALITY INFRA’TURE
  - PORT SERVICES
  - INT’L FREIGHT FRWRDING
  - PACKAGING PRODUCTION

- **REGIONAL** (<1 week by road)
  - FEED PRODUCTION
  - DAIRY FARMING MACHINERY PRODUCTION
  - PROCESSING MACHINERY PRODUCTION
  - OTHER INGREDIENT PRODUCTION
  - BRANDING & MARKETING
  - DISTRIBUTION
  - POINT OF SALE / RETAIL

- **GLOBAL**
These are dairy goods produced and sold locally for which are consumers would be unwilling to pay a premium. In HICs this might include ‘generic’ mass-produced fresh milk. In LICs this might include milk that is consumed directly by the farmer’s family and associates.

Value chains in this group of segments differ greatly depending on sophistication of consumer but in all case;
- Barriers to entry are relatively low but returns are minimal
- Competition is local to the extreme
- Product is difficult to differentiate
- Consumers are not ‘sophisticated’
- Only the lowest form of local quality requirements need to be met
- Product is particularly vulnerable to substitution from products in “Tradable, Stockable, Global” group of segments
Ideal Value Chain Structure – B. Perishable, Non-Premium (cont…)

**Colour Code**: 
- MILK PROD’ON: KNL
- COLL’N SERVICES: LAB
- NON-DAIRY INGRIED’S: KNL
- VET SERVICES: KNL
- MAINT-CE: KNL
- MILK PRO’G: KNL
- DISTRIBUTION: LAB
- POINT OF SALE / RETAIL: LAB
- FEED PRODUC’N: N-RES
- DAIRY FARMING MACHIN’RY: CAP
- PROCES’G MACH’RY: KNL
- PACKAGING PRODUCTION: CAP

**Description of Activities**
- LOCAL: (<1 day by road)
- NATIONAL: (2-3 days by road)
- REGIONAL: (<1 week by road)
- GLOBAL
These are premium dairy brands that can be traded internationally despite their perishability due to brand recognition. Such products include Roquefort cheese (France), Parmigiano cheese (Italy), Haagen Dazs ice-cream (US, France ++)

Segments in this group are characterized by very specific high quality herds or processing that would usually need to be certified / branded.

Producers may be large or small; receiving certification is the greatest hurdle in many cases rather than size of operation.

Very high barriers to entry mean that competition is limited

Markets are often international, therefore in order to reach maximum potential producers must have access to high quality logistics that will not threaten the quality / viability / integrity of the product.

Where the bradinf/certification is derived from the farming activity, producers in this group of segments are relatively powerful vis-à-vis the processor. Where the emphasis is in the processing, producers have less power.
This group of segments includes perishable products that local consumers are willing to pay a premium for perhaps because of local preference for local flavor (e.g. Mtindi in Tanzania), bias towards locally-produced products (e.g. fashionable support for local farmers and locally-produced products in US), desire for ‘freshness’ (e.g. rejection of preservatives/additives in California) or any other attribute property that increases local consumers’ willingness-to-pay for local products.

Companies operating within this group of segments are typically artisanal and entrepreneurial as there is opportunity to differentiate the product within the local community through product-notoriety or small-scale marketing.

Producers typically perform engage directly in value-added activities (e.g. cheese/yoghurt making and small scale processing)

The absorption of some of the processing and value-added activities means that producers in this group of segments are more powerful than in groups A and C and may have some negotiation power with retailers even where the concentration of retailers is very high.

However, depending on source of premium, success may depend on availability of retail points with dedicated/reserves refrigeration space for (i.e. not reserved for Coca-cola / Walls products)
Ideal Value Chain Structure – D. Perishable, Premium, Local (cont…)
3. APPLYING THE APPROACH IN BANGLADESH
INDUSTRY-SPECIFIC GLOBAL VALUE CHAINS
CONTENTS APPLYING THE APPROACH IN BANGLADESH

1.  Background  Slide 38

2.  Notable Behaviors & Trends  Slide 55

3.  Strategic Options for Bangladesh  Slide 61

4.  Recommendations  Slide 72
Background
Milk production is one of the most important economic activities in Bangladesh, providing ~3.6 million households with supplementary income.

- 66% of the country’s 159m people live in rural areas— an estimated 80% of these households being small-scale or landless farmers, with dairying providing full or part-time employment to roughly 20% of the rural population

- The dairy system in Bangladesh is characterized by small-scale mixed farms (coupled with crops and other off-farm activities), with each household averaging 2-3 indigenous cows

- Bangladesh is home to an estimated 23.2m cattle, including 4 million crossbreeds, of which between 4-6m are used for dairy purposes

- In 2011-2012, Bangladesh’s total milk production was 3.46m MT— much lower than neighboring Pakistan which produces >40m MT of milk/yr with ~10 million dairy cattle

- The productivity of the local breed is about 1.5–3 liters of milk/cow/day (compared with 10 liters in neighboring countries such as China and India) over a lactation period of 150-180 days/year, while the productivity of crossbreeds is 8–10 liters/cow/day (compared to 15–20 liters in these other countries) over a period of up to 250 days

- Locally produced liquid milk accounts for 85% of the dairy market, of which an estimated 15% is consumed on-farm and only around 10-15% is processed to be sold in the formal market (imported milk powder accounts for the other 15% of the overall market)

- Several government, NGO, and private sector initiatives have made progress in transforming dairy into a more value-driven and market-oriented sector in recent years

Sources: World Bank WDI; BOI, 2015; USAID, 2015; Uddin et al, 2011
Farming systems, based on input-output, in Bangladesh.

<table>
<thead>
<tr>
<th>Description of farming systems</th>
<th>Traditional subsistence</th>
<th>Extensive</th>
<th>Intensive</th>
<th>Bathan</th>
</tr>
</thead>
<tbody>
<tr>
<td>System boundary</td>
<td>Rural subsistence</td>
<td>Rural to peri-urban</td>
<td>Peri-urban</td>
<td>Peri-urban (cooperatives)</td>
</tr>
<tr>
<td>Breed</td>
<td>Local, non-descript, indigenous</td>
<td>Superior local, few a cross-bred with Jersey, Sahiwal</td>
<td>Superior local, mostly cross-bred with HF, Jersey, Sahiwal</td>
<td>Mostly cross-bred with HF and Jersey, very few Pabna milking cows (local)</td>
</tr>
<tr>
<td>Herd size</td>
<td>1–6</td>
<td>1–6</td>
<td>2–10</td>
<td>2–30</td>
</tr>
<tr>
<td>Milk yield (litres/cow/lactation)</td>
<td>600–700</td>
<td>600–800</td>
<td>1,000–1,400</td>
<td>1,200–1,800</td>
</tr>
<tr>
<td>Feeding system</td>
<td>Cut and carry; tethering</td>
<td>Periodic grazing on public land</td>
<td>Stall feeding supplemented by concentrate and green fodder</td>
<td>Six-month stall feeding followed by six-month bathan feeding</td>
</tr>
<tr>
<td>Market access</td>
<td>Limited</td>
<td>Access to spot market only</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Access to service (veterinary and AI)</td>
<td>Limited access</td>
<td>Access with high costs</td>
<td>Good access</td>
<td>Good access with low cost</td>
</tr>
</tbody>
</table>

*Source: Uddin et al, 2011*
Statistics on Bangladesh’s dairy industry vary widely-- for example, here is a comparison of the dairy industry in Bangladesh vs Pakistan from FAOStat (2015).

### Milk Animals (Head)

<table>
<thead>
<tr>
<th>country</th>
<th>item</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>Milk, whole fresh cow</td>
<td>3960000</td>
<td>F</td>
<td>3990000</td>
<td>F</td>
<td>4022000</td>
<td>F</td>
<td>4034000</td>
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<tr>
<td>Pakistan</td>
<td>Milk, whole fresh cow</td>
<td>8720000</td>
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<td>9049000</td>
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<td>9390000</td>
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<td>9744000</td>
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[ ] = Official data | F = FAO estimate

### Yield (Hg/An)

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<td>2051</td>
<td>F</td>
<td>2050</td>
<td>F</td>
<td>2051</td>
<td>F</td>
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<tr>
<td>Pakistan</td>
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<td>12300</td>
<td>F</td>
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<td>12300</td>
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<td>12300</td>
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</table>

Fc = Calculated data

*Note: Hg/An = hectograms (100 gram unit) per animal*

### Production (tonnes)

<table>
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<tr>
<th>country</th>
<th>item</th>
<th>2006</th>
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<tbody>
<tr>
<td>Bangladesh</td>
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<td>812000</td>
<td>F</td>
<td>818000</td>
<td>F</td>
<td>825000</td>
<td>F</td>
<td>827000</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Milk, whole fresh cow</td>
<td>1072000</td>
<td></td>
<td>1113000</td>
<td></td>
<td>1155000</td>
<td></td>
<td>1198500</td>
</tr>
</tbody>
</table>

[ ] = Official data | F = FAO estimate

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Improving dairy production and growing the market holds high potential for alleviating rural poverty and boosting shared prosperity.

3 MOST COMMON CATEGORIES OF DAIRY PRODUCERS:

1. Landless and very smallholders
   • 90% of all dairy farmers
   • 1-3 indigenous cows with very low yields
   • Mixed farming on 0.02–1.0ha of land, with no land allocated for dairying except that for holding cattle
   • Family labour only, large role and responsibilities for women
   • Produce an estimated 40% of all liquid milk in the market

2. Smallholders
   • 1-5 cows, some crossbred
   • 1-3ha of land
   • Some stall-feeding systems, purchased concentrates
   • Better access to services, e.g. AI, veterinary, extension
   • Farmers sell 85% of milk produced
   • Hired labour

3. Small and medium producers
   • 10-20+ cows, mostly crossbred with higher yields
   • Good access to inputs and services at low cost
   • “Bathan” dairy unit production system used by cooperatives

Source: BOI, 2015; Uddin et al, 2011
Milk yield (1000kg ECM per cow per year) by country.

Source: Hemme et al, 2014
Daily consumption of milk is far below regional comparators, but demand growth is expected to continue to outstrip production growth going forward.

### Demand for dairy products in Bangladesh

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated milk production (2011-2012)</td>
<td>3.46m MT</td>
</tr>
<tr>
<td>Recommended consumption* (m MT)</td>
<td>12.8m MT</td>
</tr>
<tr>
<td>Total daily consumption</td>
<td>47ml per person per day</td>
</tr>
<tr>
<td>Growth in demand for milk and dairy products</td>
<td>10% per year</td>
</tr>
<tr>
<td>Growth of local production</td>
<td>7-9% per year</td>
</tr>
<tr>
<td>Estimated market size in 2022</td>
<td>US$63.6b</td>
</tr>
</tbody>
</table>

* Based on World Health Organization recommended consumption of 250ml of milk per day per person.

Source: BOI, 2015; FAO, 2007
## Milk consumption by country (kg/capita/yr).

<table>
<thead>
<tr>
<th>Country</th>
<th>Consumption per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>16.18 kg/yr</td>
</tr>
<tr>
<td>India</td>
<td>68.72 kg/yr</td>
</tr>
<tr>
<td>Myanmar</td>
<td>25.52 kg/yr</td>
</tr>
<tr>
<td>Nepal</td>
<td>40.89 kg/yr</td>
</tr>
<tr>
<td>Pakistan</td>
<td>159.0 kg/yr</td>
</tr>
</tbody>
</table>

*Source: FAO, 2007*
Annual milk production in Bangladesh grew 6.2% between 2005 and 2012.

- **Growth** was largely due to an increasing number of crossbred cows, more institutional investment in dairy, rising market demand for processed dairy products, and the implementation of dairy development programs.

- Intensification of dairying is being driven by rapidly decreasing availability of agricultural land.

- Smallholder milk producers supply all the fresh liquid milk for the informal traditional market and roughly three quarters of the raw milk used in formal processing.

- Cooperatives and institutional dairy enterprises collect milk from smallholders through primary village cooperatives and then process and distribute the milk to all major cities in the country.

- The cooperative model has been successful in creating jobs, reducing collection and distribution costs, and improving the quality of milk.

*Source: BOI, 2015; Uddin et al, 2011*
Yearly milk production and change in Bangladesh (million MT).

Source: Uddin et al, 2011
Within the formal dairy sector, over 90% of the milk is processed and packaged as pasteurized milk—only 10% is processed into cheese, butter, ghee, and milk powder.

- The Bangladeshi dairy industry is dominated by a number of large players—namely, Milk Vita and BRAC Dairy (Aarong)

### Producers of Pasteurized and Flavored Milk*

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of diary enterprises</td>
<td>15-20</td>
</tr>
<tr>
<td>Average milk collection per day per chilling station</td>
<td>800-1,300 liters</td>
</tr>
<tr>
<td>Milk price at source (based on fat content)</td>
<td>US$0.55-0.65 per liter</td>
</tr>
<tr>
<td>Average retail price (Aug. 2013-July 2014)</td>
<td>US$0.85 per liter</td>
</tr>
</tbody>
</table>

* Flavored milk varieties include chocolate, mango, banana, and strawberry—made with UHT milk.

Source: BOI, 2015
With a wide gap between supply and demand, the Bangladeshi dairy sector is dependent on imported milk powder.

- Formal milk processors source roughly 50% of their milk from local farmers, with the other half supplied via imports of dairy products, primarily skimmed milk powder.
- From August 2013-July 2014, Bangladesh imported 53,539 tons of milk powder, while producing 7,000 tons locally (3 local producers).
- Bangladeshi processors have struggled to sell their milk powder because the cost of production remains high and the milk powder is not considered of the same quality as imported powder (preferred by industrial buyers).

**Milk powder - average retail price (Aug ’14-July ’13)**

<table>
<thead>
<tr>
<th></th>
<th>Locally produced</th>
<th>Imported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>US$7.36/kg</td>
<td>US$9.44-10/kg</td>
</tr>
</tbody>
</table>

Note: 100 liters of milk produce 12-12.5kg of WMP

*Source: BOI, 2015; ITC Trade Map, 2015*
Bangladesh imports a significant—and increasing—amount of milk powder.

<table>
<thead>
<tr>
<th>Product code</th>
<th>Product label</th>
<th>Bangladesh's imports from world</th>
</tr>
</thead>
</table>

Sources: ITC calculations based on UN COMTRADE statistics. Data based on the partner reported data (Mirror data).
Total costs of milk production (US$/100kg ECM)

Global average: US$42/100kg ECM (2014)

Source: Hemme et al, 2014
The government has been increasing incentives for further investment in the dairy industry.

- Dairy feed and imported dairy equipment are exempted from Value Added Tax (VAT)
- Favorable loan facilities for entrepreneurs, including a provision for 100% foreign equity
- Customs duty for imported powder milk is between 10-25%, and falls to 5% for domestic industrial use
- Concessionary benefits given for insulated road milk tanker (decreased from 5% to 2%), for animal feed (decreased from 5% to 0%), for raw milk preservatives (decreased from 12% to 0%), and for different spare parts required for AI
- In the national budget of FY 2014-2015, supplementary duty rate was reduced from 20% to 15% for butter and other fats and oils derived from milk and dairy spreads, and duties and taxes on many raw materials, such as cow pregnancy test kits and universal syringes for AI have been fully exempted

Source: Bangladesh National Board of Revenue, 2015; Islam, 2013
However, the total values of Bangladesh dairy exports are currently insignificant in the global dairy industry.

- Bangladesh exports a total of US$33.1b in goods— but the total value of dairy exports was only US$372,000 in 2014.

<table>
<thead>
<tr>
<th>Product code</th>
<th>Product label</th>
<th>World's imports from world</th>
<th>Bangladesh's exports to world</th>
</tr>
</thead>
<tbody>
<tr>
<td>'0401</td>
<td>Milk and cream, not concentrated nor sweetened</td>
<td>Value in 2010: 7025212</td>
<td>Value in 2014: 9450218</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Value in 2010: 15</td>
<td>Value in 2014: 27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Value in 2010: 101</td>
<td>Value in 2014: 46</td>
</tr>
<tr>
<td>'0405</td>
<td>Butter and other fats and oils derived from milk</td>
<td>Value in 2010: 6328865</td>
<td>Value in 2014: 8702586</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Value in 2010: 136</td>
<td>Value in 2014: 78</td>
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<tr>
<td></td>
<td></td>
<td>Value in 2010: 130</td>
<td>Value in 2014: 122</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Value in 2010: 229</td>
<td>Value in 2014: 229</td>
</tr>
<tr>
<td>'0404</td>
<td>Whey and natural milk products</td>
<td>Value in 2010: 3458664</td>
<td>Value in 2014: 6168478</td>
</tr>
<tr>
<td></td>
<td>nes</td>
<td>Value in 2010: 360</td>
<td>Value in 2014: 230</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Value in 2010: 1</td>
<td>Value in 2014: 3</td>
</tr>
<tr>
<td>'0402</td>
<td>Milk and cream, concentrated or sweetened</td>
<td>Value in 2010: 15956405</td>
<td>Value in 2014: 27830599</td>
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<tr>
<td></td>
<td></td>
<td>Value in 2010: 25</td>
<td>Value in 2014: 93</td>
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<td>Value in 2010: 682</td>
<td>Value in 2014: 181</td>
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<tr>
<td></td>
<td></td>
<td>Value in 2010: 66</td>
<td>Value in 2014: 22</td>
</tr>
<tr>
<td>'0403</td>
<td>Buttermilk and yogurt</td>
<td>Value in 2010: 3836675</td>
<td>Value in 2014: 4918155</td>
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<tr>
<td></td>
<td></td>
<td>Value in 2010: 0</td>
<td>Value in 2014: 0</td>
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<tr>
<td></td>
<td></td>
<td>Value in 2010: 297</td>
<td>Value in 2014: 12</td>
</tr>
<tr>
<td>'0406</td>
<td>Cheese and curd</td>
<td>Value in 2010: 24477422</td>
<td>Value in 2014: 32465565</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Value in 2010: 0</td>
<td>Value in 2014: 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Value in 2010: 297</td>
<td>Value in 2014: 12</td>
</tr>
</tbody>
</table>

Sources: ITC calculations based on UN COMTRADE statistics. Data based on the partner reported data (Mirror data)
Key question: Is the dairy market in Bangladesh lucrative for investors?

- Macroeconomic and market trends speak in favor of the attraction of the dairy market in Bangladesh:
  - Population growth: 1.2% annually (2014)
  - Rapid urbanization: 2.9% annually (2012)
  - Population density: 1,222 people/km$^2$
  - Rising GDP per capita: 4.9% annual growth rate (2005-2014)
  - One of the highest cattle densities in the world: 145 large ruminants/km$^2$ (2010) – compare to India (90), Ethiopia (30) and Brazil (20)
  - Rising demand for milk-based food products in daily consumption and as beverages
  - Relatively competitive cost of milk production, although not a global low cost leader
  - Introduction of new, higher-value milk products (e.g., UHT milk, yogurt, flavored milk products, locally popular milk-based drinks)
  - Introduction of aseptic milk packaging leading to longer shelf life

Sources: World Bank WDI, 2015; USAID, 2015; Uddin et al, 2011
Notable Behaviors & Trends
While dairy consumption is dramatically low in Bangladesh, the number of dairy products on the market is large and increasing rapidly.

- Dairy product categories available in the market:
  - Pasteurized Milk
  - UHT Milk
  - Milk Powder
  - Flavored Milk
  - Ghee
  - Yoghurt
  - Butter
  - Cheese
  - Curd
  - Ice Cream
  - Sweetmeats (confectionary-like snacks and desserts)
  - Local specialty drinks

- Milk powder is still the most commonly sold product at the formal retail level, with liquid milk a distant second, followed by various types of sweetened/unsweetened curd, ghee, and cheese.

- UHT and UHT flavored drinks currently only account for a very small percentage of overall sales, although domestic processors are investing heavily in scaling up production capacity.

- Domestic processors are also planning to diversify their offering of specialty drinks and ice creams, specifically tailored to local taste preferences.

- Currently, most yogurt and cheese is imported from nearby markets (e.g. Malaysia, Indonesia, Singapore).
However, due to a number of bottlenecks and structural issues, not all of these products are available throughout the country.

- The majority of milk is purchased at traditional markets, as raw milk, and taken home and boiled before consuming.
- Inefficient collection of milk via a cold chain and a lack of chilling stations or storage capabilities limit the amount of raw milk that reaches middlemen and processors.
- Even in the urban market, chilled storage capacity is minimal at point of sale—most often only a single, small cooler, that may have been provided by a company and come with conditions on use.
- For processed final goods with a shorter shelf-life, the lack of adequate cold chain services and poor infrastructure (e.g., roads, electricity) limit supply in rural areas.
Bangladesh does not have a strong ‘milk culture,’ but there are local customs and specialities that rely on dairy products.

- Mostly only young children, especially those in rural farming areas, drink milk by the glass.
- For adults, most milk is consumed indirectly—primarily by eating popular or home-cooked sweetmeats and by adding (condensed) milk, cream, or milk powder to tea.
- Sweetmeat processors are large buyers of raw milk in the informal market.
- Many of the large reputable retail sweetmeat companies process and pasteurize their own milk, sourced from nearby (peri-urban) producers.
- Almost all sweet shops also produce curd, a popular dessert item, available in two flavors: sweet and sour.
- Sweetened condensed milk is by far the most common addition to tea.
  - The most common sweetened condensed milks are made from imported milk powder, sugar, and vegetable oil.
  - These firms rely on the continued availability of cheap milk powder from developed countries to produce their products.

Source: Stakeholder interviews, 2015; USAID, 2015; Uddin et al, 2011;
Other popular products consumed locally include ghee, paneer, and various yogurt-based drinks.

- Only fresh cheese is produced in Bangladesh, due to a lack of demand for locally produced ripened cheese.
- Paneer, a fresh cheese common in South Asian cuisine, is the most available variant of cheese in Bangladesh.
- Ghee, a type of clarified butter used for preparing/cooking/frying various dishes, including confectionery goods and even traditional medicines, is another popular product.
- An estimated 80% of ghee is produced by small, informal producers.
- Borhani, a spicy digestive drink often served after meals, banquets, and weddings, and other traditional South Asian drinks are also popular.
Dairy production in certain regions of Bangladesh will face increasingly difficult conditions with the acceleration of climate change.

- Bangladesh is considered to be one of the world’s most vulnerable countries to the effects of climate change.
- Higher temperatures, more variable precipitation, more extreme weather events, and sea level rise are already felt in Bangladesh and their impacts will continue to intensify.
- Specifically for dairy farmers, the likelihood of stronger monsoons, an increasing frequency and intensity of flooding, and drought pose serious threats.
- Sea level rise and an increase in soil salinity will be a long-term challenge for those in low-lying coastal areas, as well as those living along rivers—especially in terms of irrigation and fresh drinking water.
- Crop yields are likely to decrease significantly in low-lying areas, further reducing the availability of feed.
- Ground water salinity and more intense storms are also likely to increase the cost of maintaining and repairing roads, as well as limit the construction of infrastructure in vulnerable areas.
Potential Strategic Options for Bangladesh
(indicative only*)
The global value chain for dairy products can be thought of as consisting of four broad groups of segments.

**A. Tradable, Stockable Global**
This includes dairy products that can be internationally traded (usually due to their stockability or the fact that they can be made from milk powder). They are exemplified by those products that inform the Global Dairy Trade index, e.g. WMP, SMP, non-fat dairy solids, UHT milk, UHT-based drinks, cheddar, and butter.

**B. Perishable Non-Premium**
These are dairy goods produced and sold locally for which consumers would be unwilling to pay a premium.

In HICs, this might include ‘generic’ mass-produced fresh milk. In LICs, this might include milk that is consumed directly by the farmers’ families and in local markets.

**C. Perishable Premium Global**
These are premium dairy brands that can be traded internationally, despite their perishability, due to brand recognition. Such products include Roquefort cheese (France), Parmigiano cheese (Italy), and Häagen-Dazs ice-cream (US, France ++).

**D. Perishable Premium Local**
These are perishable products for which local consumers are willing to pay a premium, due to reasons like local flavor (e.g. Kefir), bias towards locally-produced products (e.g. artisan trend in US), desire for ‘freshness’ (e.g. rejection of preservatives/additives in California) or other unique attributes that increase local consumers’ willingness-to-pay.
Preliminary research indicates that Bangladeshi firms compete in three of the four groups of segments, with the exception of ‘Perishable Premium Global.’

A. Tradable, Stockable Global

Products offered by Bangladeshi firms:
- Milk powder
- UHT milk
- Flavored UHT drinks
- Nutraceutical powder
  - Butter
  - Cheese
  - Ghee
- Condensed milk
- Ice cream

Imported products:
- All of the above
- Infant milk powder

B. Perishable Non-Premium

Products offered by Bangladeshi firms:
- Raw milk
- Curds
- Cheese
- Channa
- Local dairy drinks (lassi, labang, borhani...)

C. Perishable Premium Global

Products offered by Bangladeshi firms:
- None

Imported products:
- Premium ice cream
  - Yoghurt
  - Cheese
  - Butter

D. Perishable Premium Local

Products offered by Bangladeshi firms:
- Sweetmeats
- Pasteurized milk
- Local dairy drinks (lassi, labang, borhani...)
- Curd and yoghurt
  - Cheese
However, competitiveness in each of these segments varies widely, especially in comparison with foreign products.

- Products from each of these groups of segments are available in Bangladesh, with a varying number of local firms competing in each.
- The recent industry trend has been towards diversification of product offering and differentiation in the ‘Perishable, Premium, Local’ group of segments, with an increase in the availability of pasteurized milk and new milk-based drinks to meet local tastes.
- However, these products account for a very small percentage of the already small formal market.
- Lacking a strong ‘milk culture,’ perishable premium products are marketed and sold almost entirely to the growing urban middle and upper class.
- Industry experts and major processors predict a rapid rise in the sale of domestically produced UHT, as the storability of these products allows for much further market penetration at a rate likely to outpace the development of infrastructure and cold chain logistics necessary for perishable dairy products (e.g. pasteurized milk) to reach a wider market.
- Thus, the current market structure and trends in investment show the Bangladeshi dairy sector primarily competing in and continuing to move toward the ‘ Tradable, Stockable, Global’ group of segments.
A cursory analysis of the key elements of the ‘ Tradable, Stockable, Global’ group of segments in the context of Bangladesh offers insight.

**Global context**

1. This includes dairy products that can be internationally traded, due to their stockability or the fact that they can be made from (imported) milk powder.

2. The product is very difficult to differentiate and competition is global, therefore milk prices are often volatile. Processors have a lot of power vis-à-vis farmers and retain much more of the value.

3. Key success factors include the ability to produce high volumes of consistent, high fat-content milk (~100,000 liters/day) with access to sufficient, high-quality, and inexpensive feed and feed additives.

4. These segments are dominated by very large groups of producers as success generally requires access to global markets, ability to negotiate local/national/regional supply agreements, advertising/branding prowess and world-class risk management strategies.

5. World-class, efficient, low-cost logistics (e.g. collection, distribution, freight forwarding) are essential and may include cold chain logistics (e.g., for cheddar, butter, ice-cream).

**Local context**

1. All of these products are available on the market in Bangladesh, either produced locally or imported.

2. These conditions also apply to the local market, where the global price for milk powder (and government subsidies for Milk Vita) has a significant impact on earnings and margins.

3. Volumes, consistency, quality of milk supply, and access to improved feed are all challenges in Bangladesh.

4. The structure of the market is similar, with the two leading dairy processors being cooperatives of large groups of producers; however, at this point they are only serving the domestic market.

5. Low-cost logistics and cold chain services remain elusive, especially for collection (e.g., high number of small producers, and MCCs running at suboptimal capacity).
Bangladesh’s performance in the ‘Tradable, Stockable, Global’ group of segments.
Bangladesh’s performance in the ‘Tradeable, Stockable, Global’ group of segments.

**Description of Activities**

- **MILK PRODUCTION**: While Bangladesh has a relatively large overall cattle population and benefits from concentration of production in the Northwest of the country, small herd size per farmer, very low yields, and low quality milk are key constraints.

- **VETERINARY SERVICES**: Veterinary services are limited, although improving in reach and availability.

- **COLLECTION SERVICES**: Cold chain and cold (chilled) storage is mostly unavailable to small holder producers, outside of processors’ catchment areas. The small number of MCCs do not make full use of their capacity, due to scattered supply and suboptimal location.
Bangladesh’s performance in the ‘Tradable, Stockable, Global’ group of segments.

- **QUALITY INFRASTRUCTURE**: Bangladesh currently lacks the necessary institutional and technical capacity to ensure quality—from collection to final sale—which would improve the reputation of products and overall competitiveness.
Bangladesh’s performance in the ‘** Tradable, Stockable, Global’** group of segments.

**FEED PRODUCTION:** Access to affordable and quality feed to supplement grazing at the local farm level is limited. National feed providers face a number of constraints (e.g. low purchasing power of farmers, access to finance), and additives and supplements are primarily imported.
Bangladesh’s performance in the ‘** Tradable, Stockable, Global**’ group of segments.

- **BREEDING / R&D:** Milk production is still dominated by indigenous cattle and the introduction of cross-breeds has had mixed results.
- **DAIRY FARMING MACHINERY PRODUCTION:** Almost all dairying is labor intensive and done by hand.
- **BRANDING & MARKETING:** Branding and marketing remains a domestic concern and is generally not at a global standard, although local firms are planning on investing more in this area.
- **DISTRIBUTION:** Distribution is only a national level issue at this point and suffers from poor infrastructure and an inadequate cold chain in certain regions.
- **POINT OF SALE / RETAIL:** With products sold domestically, the largest constraint at the point of sale remains the availability of refrigeration.
What does competing in the ‘ Tradable, Stockable, Global’ group of segments mean for Bangladesh?

- Local market players face obstacles to compete in this group of segments throughout the value chain– from sub-optimal inputs (access to feed, breeds, machinery), to low milk production (herd size, yields, quality), poor logistics (collection, distribution, points of sales) and underdeveloped supporting services (veterinary services, quality infrastructure, branding and marketing).

- However, processing and processing infrastructure have developed to a high standard from a low base and dairy processors have plans to further expand their capacities (e.g. UHT milk, ice cream) based on the expectation that the domestic market for processed dairy products will grow and can be served by domestic firms.

- The success of the processors’ plans to increase processing capacity will require consistent access to sufficient volumes of quality milk at a competitive price.

- Thus, based on the Key Success Factors and Generic Strategic Options for this group of segments, arguably the most substantial challenges will be for producers to increase the total volume of milk produced through higher productivity and greater efficiency and for collection infrastructure and services to support better marketing of the milk produced.

- An increase in demand from processors— likely to include expansion of collection in former/new catchment areas and the provision of extension services/inputs to contracted farmers— could be very beneficial to farmers.
Recommendations
(indicative only*)
The segmentation of Bangladesh’s dairy sector could be useful in exploring the following policy options:

• Most of the milk produced in Bangladesh is produced in suboptimal conditions and remains unprocessed; most farmers are not in a position to maximize their revenues from their herd.

• When processing takes place, the dominant market players mostly seem to follow a business model based on competing in the more global and highly competitive ‘Tradable, Stockable, Global’ group of segments.

• Processors and industry stakeholders are confident the domestic market will continue to grow rapidly, and they have identified market opportunities for expansion and diversification of their product offering— but they will need to quickly improve capabilities to a world-class level to effectively capture market share in a sustainable manner (e.g. without prolonged government subsidies).

• The last ten years have shown that the cooperative model, greater organization of farmers in rural communities, and a stronger private sector can all help farmers increase productivity and market their milk.

• Considering that Bangladeshi dairy farmers already find themselves competing in a group of segments based on high volume and world-class efficiency, encouraging investment in the expansion of processing capacity by existing or new players could be necessary.

• Such support could notably entail improvements of the investment climate, investment promotion efforts geared toward dairy processing, and the development of key infrastructure like feeder roads or collections centers to attract potential domestic or foreign investments.
4. APPLYING THE APPROACH IN ETHIOPIA
INDUSTRY-SPECIFIC GLOBAL VALUE CHAINS
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<tr>
<th>CONTENTS</th>
<th>APPLYING THE APPROACH IN ETHIOPIA</th>
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<td>2. <strong>Demand &amp; Consumption Patterns</strong></td>
<td>Slide 85</td>
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<td>3. <strong>Market Outlook</strong></td>
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<td>4. <strong>Dairy Processing Industry Structure</strong></td>
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<tr>
<td>6. <strong>Strategic Options and Recommendations</strong></td>
<td>Slide 102</td>
</tr>
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</table>
Background
Ethiopia has the largest livestock inventory compared to peer countries in East Africa. Cow milk constitutes 93% of all milk produced.
Milk production has been increasing over time. However, this has been undermined by a declining trend in productivity (already low compared to peer countries in East Africa).

Source: FAOSTAT
Dairy farming practices require significant improvement. 99% of cattle are indigenous with very low productivity, only 0.2% of cattle herders use improved feed and only 0.2% have access to dairy extension services.

**Types of Cattle Breed - 2012/13**

- Indigenous: 99%
- Hybrid: 0.9%
- Exotic: 0.1%

**Usage of Animal Feed Types by the Percentage of Cattle Holders**

- Green fodder/grazing: 57%
- Crop residue: 30%
- Hay: 7%
- Others: 0.9%
- By-products: 0.2%

**Access to Dairy Extension Packages – 2012/13**

- Total Number of cattle holders: 15.48
- Number of holders with access to dairy extension services: 0.03

Source: Livestock Survey, CSA 2013
Four dairy farming systems in Ethiopia. The highland small holders system is the most important - it accounts for 75% of the total livestock population and 98% of milk production.

<table>
<thead>
<tr>
<th>Commercial Farms in the highlands</th>
<th>Peri-Urban and Urban Farms in the highlands</th>
<th>Rural Small holders in the highlands</th>
<th>Pastoral and agro pastoral farms in the lowlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialized commercial dairy farms</td>
<td>Small scale dairy farms in urban and peri-urban areas</td>
<td>Account for 75% of the total livestock population and 98% of milk production</td>
<td>Milk is key for household food security; production is primarily for household consumption</td>
</tr>
<tr>
<td>Concentrated in the central highland around major cities with high demand for milk</td>
<td>Produce primarily for the market; target consumers in nearby towns and cities including processors.</td>
<td>Cattle are used for milk production as well as animal traction</td>
<td>Natural pasture is the main source of feed</td>
</tr>
<tr>
<td>Represent the most advanced cattle husbandry;</td>
<td>No open grazing system due to scarcity of land</td>
<td>Participate in the market through hh processing of butter, cottage cheese and fermented milk</td>
<td>Higher productivity of cows compared to the rural small holder system in the highlands</td>
</tr>
<tr>
<td>Account for the majority of pure bred cattle population</td>
<td>Have better understanding of dairy management</td>
<td>Fluid milk is much less traded</td>
<td>However highly threatened by drought with about 25% of the population being destitute</td>
</tr>
<tr>
<td>Have the highest output per cow</td>
<td>Feed and vet. Service account for 50% of cost</td>
<td>The informal market is the major outlet</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Breeds are of low productivity &amp; rely on open pasture</td>
<td></td>
</tr>
</tbody>
</table>

Source: USAID, Land O’Lakes Inc. 2010
Small holder farmers supply about 98% of total milk production\(^1\). The majority of these farmers own 1-4 heads of cattle.

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\(^1\) USAID 2013.
Major milk shed zones fall within the central highlands. These zones cover most of the urban centers including Addis with relatively good infrastructure.


Cow Milk Production by Region - 2012/2013

Only a small proportion of milk is traded in fluid form

49% of milk is used at home, 7% marketed and the rest 44% processed into butter and cottage cheese. Butter is the most marketed product followed by cottage cheese and fluid milk.

Source: USAID, 2013
The informal market has remained dominant with only 2% of milk sold in the formal market.

- The informal (traditional) channel has remained dominant.
- It provides substantial amount of milk that goes to traditional processing and then traded, particularly in the form of traditional sour butter.
- Almost all milk producers in the informal channel are rural small holders in the highlands and pastoralists.
- About 70% of milk supplied to the market by rural small holders in the highlands goes to urban areas and 30% sold in rural neighborhood markets.
- In pastoral areas, there is also an informal channel to export cow milk to Kenya along the border.
- In general, the informal market is characterized by no licensing requirement to operate, low cost of production and higher producer price.

**Percentage Share of Milk Sold in the Formal Market - 2001**

- **Kenya**: 15%
- **Uganda**: 5%
- **Ethiopia**: 2%


Demand and Consumption Patterns
The majority of dairy product types currently selling in the market are domestically produced, particularly in the central highlands.

<table>
<thead>
<tr>
<th>Domestically produced</th>
<th>Imported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh raw milk</td>
<td>Powdered milk (various brands)</td>
</tr>
<tr>
<td>Pasteurized milk</td>
<td>Infant formula</td>
</tr>
<tr>
<td>Yogurt</td>
<td>UHT milk</td>
</tr>
<tr>
<td>Flavored yogurt</td>
<td>Yogurt</td>
</tr>
<tr>
<td>Cheese</td>
<td>Flavored yogurt</td>
</tr>
<tr>
<td>Table butter</td>
<td>Cheese</td>
</tr>
<tr>
<td>Local fermented butter (Kibe)</td>
<td>Table butter</td>
</tr>
<tr>
<td>Local cottage cheese (Ayib)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Mission findings
Dairy consumption culture in the highlands is different from that in the lowlands. Dairy farming practices also differ

### The highland dairy market
- Urban centers are primary outlets for processed milk while in rural areas demand is mainly for whole unprocessed milk.
- Overall, there is a dominant fresh milk culture; UHT and powdered milk can not easily compete in the market.
- As a result, domestic producers dominate.
- The population is predominantly Christian with long fasting periods resulting in seasonal variations in demand.
- Cooler weather is convenient for dairy farming. As a result dairy farming is done for commercial purposes in areas where there is market access (i.e., in urban and peri-urban areas).

### The lowland dairy market
- Livestock is the major source of livelihood (almost no sedentary agriculture). Communities are aware of the nutritional value of milk.
- UHT and powdered milk are already common in the market and consumers are used to the taste. (imported/smuggled through Djibouti and Somalis)
- As a result, the dairy market is integrated to the global market through imported UHT and powdered milk.
- The population is predominantly Muslim and there is no demand seasonality.
- Cattle are the primary sources of livelihood, very low level of commercialization and a culture of cattle as a source of prestige even when it is not a profitable activity due to the harsh climate.

Source: Mainly Based on discussion with local processors (mission findings) USAID Land O’Lakes, 2010
In the central highlands, where the majority of milk processors are concentrated, demand is seasonal due to the long fasting seasons of the Orthodox church.

**Demand seasonality in the central highlands**

- The majority of milk processors are concentrated in the central highlands, particularly in Addis Ababa and surrounding areas.

- However the population in the central highlands is predominantly Orthodox Christian observing long fasting seasons with restrictions on dairy products.

  - 255 fasting days in a year. The most widely observed seasons are the 55 days great lent in March /April and the 16 days season in August.\(^1\)

  - Orthodox Christians account for 43% of the total population in the country.\(^2\)

**Strategies adopted by processors**

- During fasting season cheese, local cottage cheese (ayib) and butter are produced and stored for sale during non-fasting seasons.

- Diversifying to UHT is considered as another option. Most processors are aware of the market opportunities in the low lands where UHT is already imported as well as opportunities to export to Djibouti, Somalia and Sudan.

- However there seems to be less awareness regarding the relatively big scale requirement of UHT plants.

Source: Based on discussion with local processors (mission findings)

Market outlook
Future outlook is positive – a 10% average annual growth in GDP per capita over the last ten years and a 65% increase in urban population in 2011 vs. 2000.

**Urban Population Size Estimates**

- **Age 0 - 9**: 1.9, 1.8, 2.1, 2.8
- **Age 9 and Above**: 5.7, 5.8, 7.0, 9.8

**Number of Cities Over 20 and 50 Thousand People**

- **Cities over 20,000 People**
  - 1994: 43
  - 2007: 88
- **Cities over 50,000 People**
  - 1994: 13
  - 2007: 27

**Trends in GDP Per Capita**

Sources: National Household Income and Expenditure surveys, CSA (Various years)
IFPRI, 2009

*Source: WDI*
Relatively low level of per capita consumption of milk represents further potential to expand the market. Milk consumption in Ethiopia is just about 40% of that in Kenya.

- Ethiopians consume less dairy products than other African countries and far less than the rest of the world.\(^1\)
- On the other hand, they regularly consume other dairy products such as butter, ayib (cottage cheese) and fermented milk.\(^2\)
- Average household expenditure on milk and milk products is only 4% of the total household food budget.\(^3\)
- In general, the milk market is characterized by low per capita consumption of milk and limited nutritional awareness of the dairy education, research and promotion on consumption of milk.\(^4\)

Source: FAOSTAT

\(^1\) 1, 2, 4, SNV Ethiopia, 2008
\(^2\) USAID, Land O’ lakes, 2010
Persistent gap between demand and supply as well as untapped market potential for new products further adds to the positive market outlook.

- In 2006, a survey of 25 food retailers in Addis Ababa, shortage of supply of dairy products was referred as a primary problem. In some cases respondents indicated that sales could increase by 300% if supply was available.

- In a follow-up survey in 2010, the retailers confirmed that supply continued to be the major problem in dairy sales.

- Fluid milk continues to lead sales in the formal dairy sector followed by flavored yogurt, a relatively new product to consumers in Addis and other urban areas.

- Cheese, flavored yogurt and table butter are identified by retailers as growth categories.

- A portion of the demand for cheese and flavored yogurt is currently being met by imports but expanded production represents strong opportunity for Ethiopian dairy processors.

Source: USAID, Land O’ Lakes, 2010
Caveat: Urban purchasing power may be affected by deteriorating income distribution in urban areas and higher prices of dairy products.

According to a 2010 survey by Land O Lakes Inc., 92% of cafes/hotels and 91% of consumer households covered by the survey stated very high price of dairy products as a major challenge.


Source: USAID, 2013
The Dairy Processing Industry Structure
The positive market outlook coincides with an increase in the number of domestic processors and introduction of new dairy products – some transition since 2005.

- The number of processors has increased from just 5 before 2000 to about 20 now. None of them are foreign brands.

- In 2000 the product line consisted of pasteurized milk and butter. In 2010, it increased to include yogurt, flavored yogurt, UHT, cultured milk, ice cream, and cheese. Only one firm has a UHT line.

- Geographically, processors are concentrated in the greater Addis Milk shed and many compete for market share in Addis.

- They are competitive in their purchasing practice of raw milk as well; most supply milk from the same radius surrounding Addis.

- The majority of milk plants operate under capacity. During off-fasting season, the main reason is shortage of raw milk.¹

- Operations tend to be vertically integrated; some have their own dairy farms, collection centers, transport & retail shops as well as outsourcing some of these services.

Source: USAID, 2013

¹ Mission finding
Number of dairy cooperatives has also expanded. However only two have their own processing plant and distribution outlets selling under their own brands.

- As of 2013 there were 112 dairy cooperatives in the main milk producing areas.
- 48% of these cooperatives are concentrated in the greater Addis milk shed. (Circled in red on the graph)
- Two of the cooperatives, Selale and Ad’aa own their own processing plant and distribution outlets selling under their own brand.
- In the case of Ad’aa it started out as a supplier to processors and through time forward integrated to processing with some help from donors.
- Both of these successful cases of cooperatives forward integrating to processing fall within the greater Addis milk shed (Ad’aa in Debre Zeit and Selale in Fiche).

Source: USAID, 2013
Imports account for an insignificant share of the total value of milk produced. However absolute value of dairy imports has been growing.

<table>
<thead>
<tr>
<th>Year</th>
<th>Value of Fresh Cow Milk Domestically Produced (Millions of USD)*</th>
<th>Value of Total Dairy Products Imported (Millions of USD) **</th>
<th>Share of Imports in Total Value of Domestic Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>267.24</td>
<td>0.0</td>
<td>0.00</td>
</tr>
<tr>
<td>2001</td>
<td>257.76</td>
<td>3.1</td>
<td>1.21</td>
</tr>
<tr>
<td>2002</td>
<td>561.31</td>
<td>2.7</td>
<td>0.48</td>
</tr>
<tr>
<td>2003</td>
<td>647.12</td>
<td>5.7</td>
<td>0.88</td>
</tr>
<tr>
<td>2004</td>
<td>654.41</td>
<td>4.6</td>
<td>0.71</td>
</tr>
<tr>
<td>2005</td>
<td>616.25</td>
<td>5.6</td>
<td>0.91</td>
</tr>
<tr>
<td>2006</td>
<td>703.52</td>
<td>7.7</td>
<td>1.10</td>
</tr>
<tr>
<td>2007</td>
<td>1087.31</td>
<td>5.9</td>
<td>0.54</td>
</tr>
<tr>
<td>2008</td>
<td>1627.65</td>
<td>9.3</td>
<td>0.57</td>
</tr>
<tr>
<td>2009</td>
<td>1255.8</td>
<td>10.3</td>
<td>0.82</td>
</tr>
<tr>
<td>2010</td>
<td>1470.21</td>
<td>17.6</td>
<td>1.20</td>
</tr>
<tr>
<td>2011</td>
<td>1966.39</td>
<td>10.4</td>
<td>0.53</td>
</tr>
<tr>
<td>2012</td>
<td>1868.1</td>
<td>10.0</td>
<td>0.53</td>
</tr>
<tr>
<td>2013</td>
<td>2243.76</td>
<td>10.5</td>
<td>0.47</td>
</tr>
<tr>
<td>Average</td>
<td>1087.6</td>
<td>7.39</td>
<td>0.71</td>
</tr>
</tbody>
</table>

Source: FAOSTAT* and UN COMTRADE**
Powdered milk accounts for the highest share of dairy imports. However cheese, butter and yogurt are growing fast taking over some import market share.

**Percentage Share of Major Dairy Import Items in Total Value of Dairy Imports over Five Year Periods: 2000-2014**

- 2010-2014: 3.3%, 3.0%, 3.9%, 6.1%, 3.3%
- 2005-2009: 94.9%, 3.3%, 90.8%
- 2000-2004: 77.7%

**Fastest Growing Dairy Import Items - Cheese, Butter and Yogurt (2001-2014)**

- Yogurt
- Milk and Cream, not concentrated not sweetened
- Milk and Cream, concentrated or sweetened
- Butter
- Cheese and Curd
- Other Dairy

Source: Using data from UN COMTRADE
Since September 2015, Fonterra started packing its “Anchor” brand in partnership with Faffa Foods, a local food processor. 70% of equity owned by Fonterra

The product is a fortified powdered milk claimed to contain more than 30 nutrients essential for child growth

It is promoted around the national issue of child malnutrition. Five million USD is planned for promotion

It sells for half the price of other powdered milk products in the market. It is also marketed in an affordable packaging size for the poor.

The company pays 10% in import tariff compared to 35% by the rest of powdered milk importers.

It plans to pack 2000 tons of powdered milk during the first year. By 2018 it plans to increase to 6000 tons covering 45% of total national demand and exporting 20% to other African countries

In three years it plans to start packing liquid milk with an investment of 30 million USD.

Source: Addis Fortune, Aug 24, 2015 [Vol 16, No 799]

1 Discussion with company representatives (Mission finding)
Social and Environmental Significance
Cattle ownership is important for food security among rural highlanders and more so in the pastoral low lands. No systematic estimation of its environmental impact

<table>
<thead>
<tr>
<th>Household Food Security</th>
<th>Environmental impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the highlands cattle are primarily used to provide traction power for agriculture</td>
<td>Globally the livestock sector is responsible for 18% of green house gas emissions measured in Carbon dioxide equivalent</td>
</tr>
<tr>
<td>They are also sources of cash from dairy product sales, household consumption of dairy products and sources of insurance during emergency</td>
<td>There is no formal estimate conducted for Ethiopia except for some anecdotal information from surveys</td>
</tr>
</tbody>
</table>
| In pastoral areas livestock are the major sources of livelihood; crop production is insignificant | A survey conducted in the Borena pastoral areas (South West Ethiopia) ranks the most important environmental impacts of the livestock in the area as;
  Deforestation .................1<sup>st</sup>
  Water resource depletion ........2<sup>nd</sup>
  Water pollution .................3<sup>rd</sup> |
| Household food security is fragile in pastoral areas due to susceptibility to frequent drought as well; 25% of the population is destitute | |
| As a result in pastoral areas cattle ownership is relatively more critical for household food security | |

Source: USAID 2013  
Source: FAO 2011
Potential Strategic Options & Recommendations

(indicative only*)
The analysis revealed four broad value chain ‘groups’

These groups can be loosely defined by their perishability, whether or not they can be sold at a premium and whether or not there is a global market for the product.

**A. Tradable (Stockable) Global**
This includes dairy products that can be internationally traded (usually due to their stockability or the fact that they can be made from milk powder). They are exemplified by those products that inform the Global Dairy Trade index. E.g. Whole milk powder, cheddar, lactose, butter milk powder, rennet casein.

**B. Perishable Non-Premium**
These are dairy goods produced and sold locally for which are consumers would be unwilling to pay a premium.

In HICs this might include ‘generic’ mass-produced fresh milk. In LICs this might include milk that is consumed directly by the farmer’s family and associates.

**C. Perishable Premium Global**
These are premium dairy brands that can be traded internationally despite their perishability due to brand recognition. Such products include Roquefort cheese (France), Parmigiano cheese (Italy), Haagen Dazs ice-cream (US, France ++)

**D. Perishable Premium Local**
These are perishable products that local consumers are willing to pay a premium for perhaps because of local flavor (e.g. Kefir), bias towards locally-produced products (e.g. artisan trend in US), desire for ‘freshness’ (e.g. rejection of preservatives/additives in California) or any other attribute property that increases local consumers’ willingness-to-pay.
The **Perishable, Premium, Local** and the ** Tradable (stockable) Global** value chain groups broadly represent the two existing value chain systems in Ethiopia.

### The highland dairy value chain

#### D. Perishable Premium Local

These are perishable products that local consumers are willing to pay a premium for perhaps because of local flavor (e.g. Kefir), bias towards locally-produced products (e.g. artisan trend in US), desire for ‘freshness’ (e.g. rejection of preservatives/additives in California) or any other attribute property that increases local consumers’ willingness-to-pay.

![Perishable Products](image)

### The low land dairy value chain

#### A. Tradable (Stockable) Global

This includes dairy products that can be internationally traded (usually due to their stockability or the fact that they can be made from milk powder). They are exemplified by those products that inform the Global Dairy Trade index. E.g. Whole milk powder, cheddar, lactose, butter milk powder, rennet casein.

![Trademarked Products](image)
These are perishable products that local consumers are willing to pay a premium for perhaps because of local flavor (e.g. Kefir), bias towards locally-produced products (e.g. artisan trend in US), desire for ‘freshness’ (e.g. rejection of preservatives/additives in California) or any other attribute property that increases local consumers’ willingness-to-pay.

Companies operating within this group of segments are typically artisanal and entrepreneurial as there is opportunity to differentiate the product within the local community through product-notoriety or small-scale marketing.

Producers typically engage directly in value-added activities (e.g. cheese/yoghurt making and small scale processing).

The absorption of some of the processing and value-added activities means that producers in this group of segments are more powerful than in groups A and C and may have some negotiation power with retailers even where the concentration of retailers is very high.

However, depending on source of premium, success may depend on availability of retail points with dedicated/reserves refrigeration space for (i.e. not reserved for Coca-cola / Walls products).
Ethiopia has relatively good positioning in the **Perishable, Premium, Local** value chain group through its existing highland value chain system.

**D. Perishable Premium Local**

These are perishable products that local consumers are willing to pay a premium for perhaps because of local flavor (e.g. Kefir), bias towards locally-produced products (e.g. artisan trend in US), desire for ‘freshness’ (e.g. rejection of preservatives additives in California) or any other attribute property that increases local consumers’ willingness-to-pay.

- In the highlands there is a dominant fresh milk culture coupled with preference for local flavors in fermented butter (kibe) used for cooking and in cottage cheese (ayib).
- Demand is almost exclusively met through domestic production.
- The absence of scale requirement for efficiency has allowed for a number of small and medium scale processors to be active in this value chain. Processors in this value chain range from;
  - small holders with 1-4 cows processing traditional butter, cottage cheese and raw milk sold in the informal market (numerous)
  - to formal sector processors with capacities ranging from 1,000 to 60,000 lt./day¹ (about 20)
  - to cooperative owned processing plants with their own dedicated retail outlets selling their own brand (2)

Source: Mission findings ¹ USAID, 2013
Ethiopia has relatively good positioning in the **Perishable, Premium, Local** value chain group through its existing highland value chain system (cont...)

### D. Perishable Premium Local

These are perishable products that local consumers are willing to pay a premium for perhaps because of local flavor (e.g. Kefir), bias towards locally-produced products (e.g. artisan trend in US), desire for ‘freshness’ (e.g. rejection of preservatives/additives in California) or any other attribute property that increases local consumers’ willingness-to-pay

- The number of processors supplying to the formal market and the number of product lines responded quite favorably to positive market signals from higher income and urbanization since 2000.

- Almost all of these processors are geographically concentrated in the greater Addis milk shed competing for the end market as well as well as for raw milk supply.

- This geographic concentration has the potential for further entrepreneurship through stronger competition

- The value chain system is significant in size; the highland is home to the majority of the population and to major urban centers. It also accounts for the bulk of raw milk production

Source: Mission findings
Existing activities in value chain structure – D. Perishable, Premium, Local

**Colour Code**
- Optimal
- Sub-optimal
- Not present

**Description of Activities**

**LOCAL**
(<1 day by road)

- **Milk Production**
- **Collection Services**
- **Vet Services**
- **Maintenance**
- **Dairy Farming**
- **Packaging Production**

**NATIONAL**
(2-3 days by road)

- **Non-Dairy Ingredients**
- **Quality Infrastructure**

**REGIONAL**
(<1 week by road)

- **Feed Production**
- **Breeding / R&D**

**GLOBAL**

- **Dairy Farming Machinery**
- **Processes’ Machinery**
- **Packaging Production**
- **Breeding / R&D**
- **Brand / MKTG**
Existing value chains structure for **Perishable, Premium, Local** - suboptimal operations in a number of points along the value chain.

1. **Shortage of consistent supply of quality raw milk**
   - there seems to be competition for raw milk and not enough supply for all; Off fasting season, shortage of raw milk supply is main reason for under capacity utilization
   - Shortage may have been compounded by low productivity of cows

2. **Serious shortage of feed**
   - Only 0.2% of cattle holders have access to improved feed; limited supply and unstable prices for feed confirmed as serious problem
   - Price and availability of domestic ingredients are key drivers of the market (very small import component)
   - Unfavorable VAT system; VAT applied on feed processing while by product producers (flour mills) and end product producers (all fluid milk) are exempted from VAT

3. **Shortage of supply of high breed cows and limited extension services**
   - An insignificant number of commercial breeders. The cost of heifers is about 40,000 birr coupled with a significant wait time
   - Only 0.2% with access to extension while there are anecdotes for success to increase productivity through proper feed, bred type and extension
4. Access to land

- Limited coordination between Federal and Regional Investment Bureaus in matters of access to land and investment
- No clear zoning policy for urban and peri-urban dairy farmers given potential pressures to quite the business due to hygiene related complaints from neighbors

5. Inefficient operation and/or no specialization in cold chain logistics

- Most processors have a few refrigerated cars but no chilling centers, milk has to be transported 2-3 hours before being chilled
- Most plan to invest privately, no sign of coordination in investment plans. No specialized cold chain logistics providers in the sector either. The only logistics company specializing on perishables, Ethiopian Perishables Plc has no presence in the dairy industry (works with flower companies only)

6. Weak quality control and certification system and cumbersome process for dairy input imports

- There seems to be no compulsory and regular inspection. No private certifying agency either. But interest for compliance by processors
- Lengthy procedures to import dairy related goods, probably due to limited knowledge of customs officials about the goods being imported. Case in point: Rennet culture for cheese making
This includes dairy products that can be internationally traded (usually due to their stockability or the fact that they can be made from milk powder). They are exemplified by those products that inform the Global Dairy Trade index. E.g. Whole milk powder, cheddar, lactose, butter milk powder, rennet casein.

The product is very difficult to differentiate and competition is global, therefore milk prices are low, vulnerable and volatile. Processors have a lot of power vis-à-vis farmers and retain much more of the value.

Key success factors in these segments include the ability to produce high volumes of consistent, high fat-content milk per day (~100,000 litres) with access to sufficient, high-quality, and inexpensive feed and feed additives.

These segments are dominated by very large producers as success in this group of segments generally requires access to global markets, ability to negotiate local/national/regional supply agreements, advertising/branding prowess and world-class risk management strategies.

World-class, efficient, low-cost logistics (e.g. collection, distribution, freight forwarding) are essential and may include cold chain logistics (for cheddar, butter, ice-cream etc).
Ethiopia may not be well suited to compete in the **Tradable (Stockable) global group** as its primary value chain

### A. Tradable (Stockable) Global

This includes dairy products that can be internationally traded (usually due to their stockability or the fact that they can be made from milk powder). They are exemplified by those products that inform the Global Dairy Trade index. E.g. Whole milk powder, cheddar, lactose, butter milk powder, rennet casein.

- Products in this value chain are currently present in the market through imports of major brands like Nido and Anchor (most common in the low lands)

- The industry is driven by cost efficiency and hence it required a large minimum scale (~ 100,000). The average attained processing capacity of local processors is much below this (less than 10,000)\(^1\)

- Therefore it is a big companies’ business, not suited to the capacity of local processors and unlikely to support entrepreneurship through entry of numerous firms.

- None of the components of the ideal value chain in this group exist in Ethiopia – certainly not in the big size that is required to compete (Fonterra imports and packs its product but does not manufacture in Ethiopia).

- The only potential way small holders can participate in this segment is as suppliers of raw milk with limited market power and far removed from value addition

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Source: Various

\(^1\). USAID,2013
All of the components of the ideal value chain in Tradable, Stockable, Global group exist in Ethiopia but not at the scale that is required to compete in the segment.
**Recommendation:** Ethiopia could prioritise **Perishable, Premium, Local** segments but also consider ** Tradable, Stockable, Global** in a complimentary capacity (cont…)

- **D. Perishable Premium Local**
  - The Perishables, Premium, Local group is an already existing local industry with some dynamism in recent years.
  - It is reasonable to strengthen it for its potential for entrepreneurship and competition through its ability to support numerous small and medium scale firms including farmer cooperatives.
  - The Tradable, Stockable, Global group could be promoted as a buffer against the fall in demand during fasting season. This segment might also be a route to exporting product to neighboring countries.

- **A. Tradable (Stockable) Global**
Recommendation: Ethiopia could prioritise Perishable, Premium, Local segments but also consider Tradable, Stockable, Global in a complimentary capacity (cont...)

D. Perishable Premium Local

- Therefore promoting both the Premium, Perishable Local segments and the Tradable, Global segments could reinforce the growth in local processing in recent years.

- The key problem with this strategy is the big scale requirement in the Tradable Group vs. the smaller size of local processors.

- This can be solved through investment in a common UHT plant as well as in collection facilities and/or specialization in these services (more on next slide).

- On the other hand promoting the Tradable group as a primary value chain is likely to displace the Perishables, Local group with all the potential for entrepreneurship through numerous small and medium scale firms gone.

- Therefore, if not an outright protection for the Perishables, Local group at least there should be a level playing field for them vs. firms in the Tradable, Global group.

A. Tradable (Stockable) Global
Broader policies to support the recommended strategy.

1. Improve the supply of raw milk through;
   - Better access to land for dairy farming; have a clear zoning policy for urban/per-urban dairy farming
   - Develop a competitive feed industry: encourage investment through for example improving the tax system. Also further research to understand the key diving forces in the feed market
   - Encourage commercial breeding
   - Improve the reach and quality of dairy extension services: currently only 0.2% of cattle holders have access to extension services.

2. Investment in;
   - Specialization in cold chain logistics in the dairy sector e.g. through investment in a common collection facility. Further research in a feasible business model
   - Investment in a common UHT plant. Further research on the feasible business model

3. Promote competition
   - By ensuring a level playing field for all business in the industry. E.g. avoid discriminatory tax incentives

4. Improve the quality control and standards infrastructure

5. Reduce customs burden to import dairy related equipment and products
5. APPLYING THE APPROACH IN TANZANIA
INDUSTRY-SPECIFIC GLOBAL VALUE CHAINS
| 1. | **Background & Industry Structure** | Slide 119 |
| 2. | **Notable Behaviors & Trends** | Slide 130 |
| 3. | **Strategic Options for Tanzania** | Slide 137 |
| 4. | **Recommendations** | Slide 143 |
Tanzania has the second largest Cattle Population in Africa after Ethiopia.

50% of Tanzania Households (HH) depend on Livestock keeping/Over 62% in rural areas

86% of HH keep chicken (approx. 36 million chickens, over 95% are indigenous chicken)

48% of HH keep goats (approx. 16 million goats)

35% of HH keep cattle (approx. 25 million cattle – 97% are indigenous, mostly short horn Zebu)

9% of HH keep pigs (approx. 2.4 million pigs)

Source: MLFD/TLMI, ILRI (2014/2015)
Growth trend in the past ten years shows the livestock sector is underperforming.

Although Agriculture/Livestock employs many Tanzanians, economic growth in the past ten years has come from other sectors than Agriculture.

During the ten year period, Livestock grew at an average rate of 3.3 percent; however (in compounded terms) the sector declined by 12.2 percent.
Dairy production systems in Tanzania are divided in two main categories – the traditional and the improved/dairy cattle system

<table>
<thead>
<tr>
<th>Traditional production system with local zebu cattle</th>
<th>Dairy systems with grade cattle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pastoralists</td>
<td>Rural smallhold dairy farmer</td>
</tr>
<tr>
<td>Agro pastoral</td>
<td>Urban / peri-urban stallholders</td>
</tr>
<tr>
<td>Small holder mixed farmers</td>
<td>Medium &amp; large dairy farmers</td>
</tr>
</tbody>
</table>

- **Pastoralists**
  - A low input system occurring in arid and semi-arid areas.
  - Move with their cattle through a large area based on availability of natural pasture or harvested crop land.
  - Milk is an important product for home consumption; seasonal surpluses are available for sale provided there is an opportunity to sell.
  - Graze their cattle on communal grazing land during the wet season and on crop land after harvest when crop residues are available; Owners of the crop land benefit from manure for improved soil fertility.
  - Also use milk for home consumption and seasonal surpluses can be marketed.

- **Agro pastoral**
  - A production system mainly in the sub humid areas e.g. cattle under coconuts or banana farmers who keep cattle for manure (e.g. in Kagera).
  - Cattle density is low because of other important income opportunities but also due to disease problems (tick-borne diseases and trypanosomiasis).
  - Milk production and consumption are less common for the owners (collection cost is high).

- **Small holder mixed farmers**
  - Small mixed farms with crops and livestock in the rural areas away from the cities, farms with 1–5 dairy cows mainly originating from smallholder dairy development programmes.
  - Cattle are kept under semi–zero grazing systems based on cultivated fodder, crop residues and cut grasses from waste or communal land with varying levels of inputs (AI, bull services, veterinary care by CAHW, supplementary feed, feed conservation).
  - Direct marketing to consumers is limited and farmers rely on milk collecting centres or middlemen.

- **Rural smallhold dairy farmer**
  - Similar to rural smallholder dairy keepers but uses a higher level of inputs, especially for 12 feed and animal health services (inputs depending on milk price).
  - The majority of the milk is marketed through the informal market.
  - At present supplying the informal market is often more profitable than selling in formal market.

- **Urban / peri-urban stallholders**
  - Farms keep crossbred and purebred dairy cattle, having land available for fodder production and conserving roughage for the dry season.

- **Medium & large dairy farmers**
  - Farmers are responsible for organizing inputs delivering to milk plants or milk is processed on the farm and products sold in the cities.
Shinyanga, Tabora and Mwanza have the highest concentration of cattle, however the quality varies.

- The highest concentration of cattle is in Shinyanga, Tabora and Mwanza. The herd grew at an average rate of 2.3% annually from 1993 to 2010.

- The greatest improvements in cattle (quality/productivity) have been seen in Arusha, Kilimanjaro and Mbeya where most of the breeding programs have been focused.

Low genetic potential/low of current herd limits milk productivity

- The dairy sector is constrained by low genetic potential leading to low production efficiencies. For example, a traditional cow produces 0.5 to 1.5 liters per day while an improved/dairy cow can produce up to 15 liters.

- There is limited access to quality heifers for replacement or starting new herds, reliable AI delivery, and access to quality breeding bulls

- Artificial Insemination (AI) is expensive for Tanzanian smallholder farmers – costing about US$11 per service

- There is also lack of animal husbandry knowledge among farmer. Farmers do not apply hygiene standards and there is limited availability of farm (aluminum) storage tanks. Farmers also adulterate milk in order to increase quantities (by adding water) and density (by adding starch etc.)

- Government’s breeding programs in the early 90s were initially successful; more than 2,000 animals were bred through heifer breeding units, bull centers, and artificial insemination centers. However these programs failed due to mismanagement of facilities, declining budget allocation over time, and unsustainable subsidy program
Tsetse fly infestation limits use of otherwise vast potential for open grazing

- Tanzania has traditional dependence on grazing – open rangeland provide 90% of national herd’s food resources

- Approx. 68% of Tanzania total land area (i.e. 88.6 million Ha.) is suitable for grazing

- However, a large portion of Tanzania (about 36% land suitable for grazing) of 60 million hectares of land that are suitable for grazing) is infested by tsetse fly

- Tsetse fly infestation limits livestock movements to Tsetse free areas, causing uneven concentration of cattle, overgrazing and conflicts over agricultural land

- Currently approximately 4.4 million cattle grazing in Tsetse affected area (driven there through scarcity elsewhere), leading to low body weight, high sterility, abortions and pre–disposition to other infections, hence impairing the quality of meat and dairy products

- Many cattle herders have migrated to the southern and coastal regions causing conflicts between local communities and migrant herdsmen
Feed manufacturing has been a real challenge in Tanzania

- Dairy farmers do not have access to quality feed – i.e. quality pasture, forage, and commercial/compound feed.
- Users of commercial feed complain of poor quality feed produced by local feed manufacturers.
- Most of the Tanzanian maize is exported to Kenya, Ethiopia, South Sudan and India, this has left little maize for local use and pushed up the cost of maize.
- Soya (the by-product of the Soya oil processing) is non existent in Tanzania. In addition, there is little investment in soya farming. As a result, feed manufacturers import soya by-products from Zambia and Malawi.
- The Government had provided VAT exemption on imported soya but reinstated it in 2015. This has led to an increase in cost of producing animal feed and prices of final products.
Milk processing activities have been taking place for over five decades, however, challenges remain and the sector is still in the nascent stage

- Up to 1990 almost all milk processing capacity in Tanzania was in the hands of the Tanzania Dairy Limited (TDL) one of the parastatal companies of government–owned LIDA (Livestock Development Authority)
- Milk was collected from local cattle for the plants in Tabora and Musoma, and from parastatal dairy farms, however, the main source was skim milk powder (SMP) and butter oil (BO) donated by World food Program and European Union
- Donations of SMP and BO dropped at the end of the 1980s and TDL was making losses. In the 1990s the plants of TDL were privatized
- Many new, local and foreign, entrepreneurs took the opportunity to set up small to medium size processing facilities, however of the 35 new plants 13 closed down because they were unable to make profit
- The main causes for closure of so many factories after the privatization of TDL milk plants between 1990 and 1995, were low milk prices for farmers, concurrent increases of milk sales on the informal market, the decline in milk powder donations and commercial imports for reconstitution of milk on which quite a few factories depended
- At present there are around over 55 processing units in the country, majority being in the regions of Mara, Tanga, Arusha and Iringa due to development programs that focused in those areas and improved milk production
There are several milk processing and collection centers but most of them operate below their installed capacity.

- There are at least 55 milk processing plants and 215 Milk Collection Centers (MCCs) in the country.
- Most of these are operating below capacity; Operating below capacity is attributable to mainly lack of volume of “quality milk” as well as managerial capacity.
- However the Mbeya and Njombe and Tanga facility are operating significantly above the national average. Tanga for example, has the capacity to handle up to 60,000 liters a day a well developed network of producers.
Tanzania faces aggressive competition from imports

- Imports currently consist of about 2% of all processed milk marketed in the country. The main importers are the Kenya, Netherlands, South Africa, UAE, Denmark, and Ireland. However, products from New Zealand, Australia, etc., are also available.

- Although there are no recent studies on the impact of dairy imports in Tanzania, a study by TAMPA in 2010 indicated that a rise of imports by 9% annually over the period of 15 years, made some plants uncompetitive and about 13 plants closed down.

- The competition with imported dairy products from EAC countries is expected to grow particularly from Kenya where the sector is bigger, stronger and with the Government’s support to promote exports particularly to Tanzania and Uganda.

- Further, Kenya’s vicinity to Tanzania implies they can at short notice enter into cold range products expanding the scope of competition at product level. Already products from Brookside have higher frequency of citation in retail shop in Musoma, Mwanza and Arusha.

<table>
<thead>
<tr>
<th>Cost item</th>
<th>Tanzanian Firms</th>
<th>Kenyan Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TZS</td>
<td>% of Total cost</td>
</tr>
<tr>
<td>Cost of raw milk at factory gate</td>
<td>470</td>
<td>60%</td>
</tr>
<tr>
<td>Variable Cost</td>
<td>88</td>
<td>11%</td>
</tr>
<tr>
<td>Packaging Materials</td>
<td>50</td>
<td>6%</td>
</tr>
<tr>
<td>Transport outward</td>
<td>608</td>
<td>78%</td>
</tr>
<tr>
<td>Distribution and retailing cost</td>
<td>28</td>
<td>4%</td>
</tr>
<tr>
<td>Total cost</td>
<td>145</td>
<td>19%</td>
</tr>
<tr>
<td>Total cost</td>
<td>778</td>
<td>100%</td>
</tr>
<tr>
<td>Selling price</td>
<td>1,130</td>
<td></td>
</tr>
</tbody>
</table>

Source: TAMPA/NIRAS – Survey of the Diary Market Products, 2010
Notable Trends and Consumption Patterns
Raw milk is the most popular dairy product consumed locally

- Tanzanians do not drink milk ‘by the glass’ as is common in other parts of the world

- It is typically drunk in “Chai” (tea). Chai is traditionally extremely milky, and made with raw milk which is boiled first.

- About 97% of milk produced in the country is sold raw to consumers either directly by farmers or through Hawkers.

- Hawkers have a fairly efficient distribution network and is either sold door-to-door directly to households or through informal markets and other extremely informal channels
Processors have very little power vis-à-vis producers (unlike typical industry dynamics)

- Processors are not able to match the price than hawkers can pay at farm-gate. This is because;
  - In many cases hawkers water down the milk before selling it to consumers
  - Hawkers have no processing, management or quality control costs; usually their only added cost is transportation which means they can pay more for their input.

- Processors often don’t pay farmers for 60-90 days, whilst hawkers pay farmers immediately
- These factors make processors a very unattractive customer and they are considered to be ‘the customer of last resort’.
- Unlike the typical industry dynamics, the power of processors is extremely weak vis-à-vis producers.
Seasonal supply patterns are difficult for processors to manage as they do not correspond with demand

- Whilst raw milk sales are relatively stable during the year, processed dairy products (particularly yoghurt and mtindi) are drunk in Tanzania as a means of keeping cool. Therefore more dairy products are consumed during warmer months.

- As can be seen, in January and February when demand is at its highest, rainfall is low and therefore milk production is comparatively low. Limited supply means that processors only receive milk that farmers cannot sell to anyone else.

- Conversely production peaks in April due to a peak in rainfall at a time when demand is typically falling.

- The only correlation is in July/August where both demand and production are low.
Mtindi – a fermented variety – is the most popular processed dairy product in Tanzania.

- Mtindi – a locally fermented milk drink - is typically the most popular processed dairy product in Tanzania.

- It is made by adding lactic acid bacteria, mold or yeast to milk.

- The form and flavor depend on the quantity of bacteria/mold that are introduced and the way in which they are introduced. Whilst Mtindi is often compared to Kefir or Mursik, imported is not popular (highlighting preference for the local manner of production and preparation).

- Whilst Mtindi can be drunk as a beverage, it is also commonly eaten with Ugali, a local dish of maize flour. It is one of the most common staple foods in the region.
Other processed products are available and increasing in popularity but are market penetration is not comparable to raw milk or Mtindi

- Yoghurt has shown the most growth in recent years. As previously mentioned, sales are highly correlated with temperature. Ice-cream follows a similar pattern but unlikely Yoghurt, imported varieties are not popular.

- Powdered milk (powdered UHT) is reasonably popular among locals

- (Liquid) UHT had traditionally been sold to ex-pats mainly due to the high price. As the price slowly falls, local people are showing and interest

- Pasteurised milk is one of the least popular dairy products – probably die to the dominance of raw milk and Mtindi. The quality/health benefits associated with pasteurized milk do not sway consumers due to the fact that Raw milk is boiled (and so is considered safe).

- Cheese (mozzarella and paneer) is widely bought by restaurants and hotels but is not a popular B2C product.
Milk is not culturally associated with nutrition or health in Tanzania.

However, in many regions children drink milk because they have easy access to cows (70% of milk produced in Tanzania is drunk by the farmers or farmers’ families themselves\(^1\). In addition the Maasai consists almost exclusively of meat and milk.

Where there is no access to cows, children may be given a maize-based porridge (maize + water). At times soya beans or groundnuts are added for protein.

School Milk Feeding Programs are widely debated and discussed but seem to have had limited success.
Potential Strategic Options for Tanzania
(indicative only*)

*Illustrating the types of recommendations that could be drawn using this type of analysis assuming time and resource for greater rigor of research.
Tanzanian producers are principally competing in “Perishable Non-Premium” segments

- Tanzanian producers are principally competing at the local level in non-premium perishable segments. Producer profitability in this group of segments is typically very low (assuming there is any commercially opportunity at all).

- 97% of milk in Tanzania is drunk completely raw which (from the purest economic perspective) is an ‘ideal’ situation for farmers in that they need not relinquish value to processors or invest themselves in processing equipment. (The health risks to the community of such heavy raw milk consumption is mitigated by the fact that milk is almost always boiled first).

- However, the fact that raw milk is not drunk as a standalone drink but instead drunk in Chai (where the taste may be less discernible) means that the milk is at risk of substitution. In particular, if the price of UHT products in the region (which are currently very high) come down to more comparable levels the industry will likely be highly threatened.

- Very few UHT products are produced in Tanzania and the country does not yet have an internationally recognized or marketable brand or group of products

B. Perishable Non-Premium

These are dairy goods produced and sold locally for which are consumers would be unwilling to pay a premium.

In HICs this might include ‘generic’ mass-produced fresh milk. In LICs this might include milk that is consumed directly by the farmer’s family and associates.
UHT production may seem an attractive option for *processors*, but Tanzanian firms might struggle to compete plus UHT production but may not be in *producers’* best interests.

- In addition to the fact that UHT and long-life varieties of milk are growing globally, UHT is often cited as an attractive option and a means of managing milk surpluses during the rainy season. The thinking is that UHT could be produced during rainy season (3 months) and then sold evenly over the dry season (9 months) when raw milk is not readily available (to processors).

- However, the large economies of scale required for UHT are prohibitive. Tanzania does not have the necessary high volumes of consistent, high-fat-content milk per day (~100,000 litres) with access to sufficient, high-quality, and inexpensive feed and feed additives. Nor is there access to packaging materials at the necessary scale and quality. Locally produced products will constantly be pitted against imported varieties whose price will likely decrease rapidly.

- Even if Tanzanian producers were able to increase the quality, volume and consistency of milk in order to supply the industry, their power vis-à-vis processors would likely be much weaker than if they were to concentrate focus instead on ‘perishable, premium, local’ segments.

A. Tradable (Stockable) Global

This includes dairy products that can be internationally traded (usually due to their stockability or the fact that they can be made from milk powder). They are exemplified by those products that inform the Global Dairy Trade index. E.g. Whole milk powder, cheddar, lactose, butter milk powder, rennet casein.
Tanzania has very few of the identified activities that it needs to compete in this group of segments. Those elements that it does have are sub-optimal apart from international logistics. Crucially milk production and feed production and packaging production are effectively non-existent when one considers the level of sophistication needed for this group of segments.
Tanzania could exploit its (limited) success in “Perishable Premium Local” segments which could offer a viable future for Tanzanian farmers.

- Local preference for locally-made Mtindi and Yoghurt (and rejection of imported brands) could indicate that there are some Tanzanian products for which local consumers are willing to pay a premium. (Note that it might alternatively indicate that Tanzanians are unwilling to pay higher prices of imported Mtindi/yoghurt).

- If the taste of locally-produced Mtindi And Yogurt is indeed discernible and preferred by local consumers, farmers may have the opportunity to leverage this preference and indeed expand into other related products.

- This group of segments is attractive because it does not require high volumes of milk production (which suits the Tanzanian context), and can be profitable for the producer. This is especially the case as value-added activities can be absorbed into the producers’ range of operations rather than outsourced to 3rd party processors. They are also easier to defend than products in the global, tradable group of segments.

D. Perishable Premium Local

These are perishable products that local consumers are willing to pay a premium for perhaps because of local flavor (e.g. Kefir), bias towards locally-produced products (e.g. artisan trend in US), desire for ‘freshness’ (e.g. rejection of preservatives/additives in California) or any other attribute property that increases local consumers’ willingness-to-pay.
Existing activities in value chain structure – D. Perishable, Premium, Local

Although many of the necessary elements to compete well in this group of segments are still sub-optimal, at least they are present (even if nascent).
HISTORY TELLS US PREFERENCE FOR RAW MILK WILL EVOLVE

- Policies that encourage the development of a market for pasteurized milk and building the infrastructure to serve that market could be more beneficial to Tanzanian producers.

- If the market for UHT were to grow instead, analysis shows that Tanzania is unlikely to have the economies of scale to support a domestic industry that could withstand foreign competition.

- Even if volume, quality and productivity could be so improved, the producers in those segments would be far weaker and have far fewer opportunities (if any) for value addition.
ANNEX: SEGMENT BY SEGMENT VALUE CHAIN ANALYSIS
INDUSTRY-SPECIFIC GLOBAL VALUE CHAINS
<table>
<thead>
<tr>
<th>STORAGE TEMP</th>
<th>NUTRITION-DRIVEN</th>
<th>NUTRICEUTICAL-DRIVEN</th>
<th>INDULGENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>dry</td>
<td>Slide 146</td>
<td>Slide 153</td>
<td>Slide 160</td>
</tr>
<tr>
<td>frozen</td>
<td>Slide 168</td>
<td>Slide 175</td>
<td></td>
</tr>
<tr>
<td>1 - 3 weeks</td>
<td>Slide 183</td>
<td>Slide 190</td>
<td>Slide 197</td>
</tr>
<tr>
<td>Once a day or more</td>
<td>Chilled</td>
<td>Slide 205</td>
<td>Slide 212</td>
</tr>
</tbody>
</table>
### ANALYSIS: GENERIC STOCKABLE DRY PRODUCTS FOR ‘NUTRITION’

<table>
<thead>
<tr>
<th>STOCKABLE PRODUCTS</th>
<th>STORAGE TEMP</th>
<th>NUTRITION-DRIVEN</th>
<th>NUTRICEUTICAL-DRIVEN</th>
<th>INDULGENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREQUENCY OF DELIVERY</td>
<td>dry</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 - 3 weeks</td>
<td>chilled</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once a day or more</td>
<td>Chilled</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NON-STOCKABLE PRODUCTS**

- [Image of non-stockable products]

**STORAGE TEMP**

- dry
- frozen
- chilled

**FREQUENCY OF DELIVERY**

- 1 - 3 weeks
- Once a day or more
Five Forces Analysis: Dairy Farmers

<table>
<thead>
<tr>
<th>Threat of New Entrants</th>
<th>Increasing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Global trends show a decrease in the total number of dairy producers, but an increase in the intensification of dairy farming—however, there is growing interest in developing markets to expand the dairy industry to support local farmers and reduce dependency on imports.</td>
<td></td>
</tr>
<tr>
<td>• The necessary market access, land area, access to feed, skilled labour, and machinery are strong barriers to entry.</td>
<td></td>
</tr>
<tr>
<td>• Requires some specialist knowledge, and the time necessary to achieve baseline certifications and licenses.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rivalry Among Existing Competitors</th>
<th>Increasing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• A consolidated market with a small number of very powerful players, each active in expanding into new global markets.</td>
<td></td>
</tr>
<tr>
<td>• With a globally determined WMP/SMP milk powder price, individual dairy farmers supplying this segment are in effect competing against any dairy farmer around the world that can also sell his/her raw milk into the supply chain.</td>
<td></td>
</tr>
<tr>
<td>• Lowest-cost production results in comparative advantage.</td>
<td></td>
</tr>
<tr>
<td>• Some reputational aspects that affect competition, although still relatively difficult to differentiate products from those available on the market.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Threat of Substitute Products</th>
<th>Increasing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Raw milk is still a necessary ingredient in the production of milk powder, but milk powder is increasingly available worldwide.</td>
<td></td>
</tr>
<tr>
<td>• The competitive landscape for milk-based drinks in this segment is also increasing, especially in terms of product differentiation and targeting of specific consumer groups.</td>
<td></td>
</tr>
<tr>
<td>• Low cost of changing products, with falling prices for pasteurized and UHT milk products in most markets.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bargaining Power of Suppliers</th>
<th>Increasing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Prices of feed are one of the main drivers of dairy profitability.</td>
<td></td>
</tr>
<tr>
<td>• Other inputs, including genetics and artificial insemination, are increasingly sophisticated and expensive.</td>
<td></td>
</tr>
<tr>
<td>• Machinery and logistics systems are increasingly complex, costly, and require new skills in production.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bargaining Power of Buyers</th>
<th>Stable → Increasing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Industrial buyers have low changing costs, desire to keep SMP/WMP prices low.</td>
<td></td>
</tr>
<tr>
<td>• Large volume of sales can increase buyers’ negotiating powers.</td>
<td></td>
</tr>
<tr>
<td>• Very price sensitive due to ability to stockpile products.</td>
<td></td>
</tr>
<tr>
<td>• The leverage of large downstream retail buyers may cause upstream price constraints in the long term.</td>
<td></td>
</tr>
</tbody>
</table>
Five Forces Analysis: Dairy Farmers (cont…)

**Is the segment profitable?**

Final products in this segment can be very profitable, however there are a very demanding set of requirements for an individual dairy farmer to be profitable in this segment. Profitability will depend on being able to either individually or collectively produce milk at large volumes.

**Who retains the profit?**

Dairy farmers in this segment are dependent on prices set globally, with little ability to differentiate their products. Profits are either retained by the industrial buyers downstream, or through large collectives/cooperatives with the capacity to operate globally.
Buyer Purchasing Criteria for Generic Stockable, Dry Products

- Hygienic tests during collection and processing
  - Organoleptic tests
    - Freshness (odor), consistency of color, taste
  - Gerber Butterfat test or lactometer test
    - Total solids (TS) or milk fat content - approx. 2.9-3.6%, but can be lower or significantly higher
    - Solids non-fat (SNF) content – generally should not be below 8.5%
- Somatic cell count – pathogens
- Additional possible testing:
  - Resazurin test – hygiene
  - Clot on Boiling (C.O.B) Test – acidity (colostral/mastitis)
  - Standard Plate Count (SPC) – total number of aerobic bacteria
  - Preliminary Incubation Count (PIC) – bacteria (mastitis)
  - Inhibitor test – drug or pesticide residues
  - Freezing Point Determination – adulteration and water content
  - Alcohol or Alcohol-Alizarin test – levels of albumen (colostrum milk) and salt concentrates (mastitis)
- Minimum necessary standards and certification from the host market government
- Consumer demand (brand recognition)
- Cost
- Size/durability of packaging and requisite distribution protocol (e.g., sorting/separating)
- Shelf-life
Dairy farmers in this segment are typically part of large cooperatives. These cooperatives compete based on economies of scale, world class logistics, and the processing capacity to produce multiple products within the dairy industry at multiple price points for markets both locally and across the globe.
Key Success Factors for Dairy Farmers in this Segment

- Ability to individually produce, or contribute within the catchment area of a cooperative/processor, a minimum of **100,000 liters of milk per day**
  - Very large herd of high-yielding cattle (individually or collectively owned)
  - Access to sufficient, high-quality, and inexpensive feed and feed additives
  - Consistent, high fat content milk
  - Access to essential services (e.g., management, IT, veterinary, collection, maintenance, waste)
- Access to processing, which is likely to require large up-front capital expenditure (either individually or collectively) and the necessary access to finance
- Chilling capacity/storage, and efficient collection services
- World-class efficiency in production and management
- World-class logistics (e.g., collection, distribution, freight forwarding)
- Access to global markets, either through foreign direct investment or (preferential) import/export
- Effective marketing, advertising, and branding
- Accurate market information
- World-class risk management strategies
Ideal Value Chain – Stockable, Dry Products for ‘Nutrition’

**LOCAL**
(<1 day by road)

**NATIONAL**
(2-3 days by road)

**REGIONAL**
(<1 week by road)

**GLOBAL**

**Colour Code**

- Ideal Value Chain – Stockable, Dry Products for ‘Nutrition’

**Description of Activities**

- Stockable
- N/A
- DRY

**FREQUENCY OF DELIVERY**

**STORAGE TEMP**

**NUTRITION-DRIVEN**

**MILK PRODUCTION**

- CAP
- N-RES

**VET SERVICES**

- KNL
- CAP

**MACHINERY MAINT’CE**

- KNL
- LAB

**COLLECTION SERVICES**

- CAP
- LAB

**PROCESSING**

- CAP
- LAB

**QUALITY INFRA’TURE**

- KNL

**PORT SERVICES**

- KNL
- ENR
- CAP

**INT’L FREIGHT FRWRDING**

- KNL

**PACKAGING PRODUCTION**

- CAP
- KNL

**FEED PRODUCTION**

- N-RES
- CAP

**DAIRY FARMING MACHINERY PRODUCTION**

- KNL
- CAP

**PROCESSING MACHINERY PRODUCTION**

- CAP

**OTHER INGREDIENT PRODUCTION**

- KNL

**BRANDING & MARKETING**

- KNL

**DISTRIBUTION**

- CAP
- LAB

**POINT OF SALE / RETAIL**

- LAB

**DOES NOT INCLUDE INFO ON TIME AND INFO INTENSITY**
### ANALYSIS: STOCKABLE, DRY, NUTRICEUTICAL PRODUCTS

<table>
<thead>
<tr>
<th>STORAGE TEMP</th>
<th>NUTRITION-DRIVEN</th>
<th>NUTRICEUTICAL-DRIVEN</th>
<th>INDULGENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>dry</td>
<td></td>
<td></td>
<td>✔️</td>
</tr>
</tbody>
</table>

**STOCKABLE PRODUCTS**

- **FREQUENCY OF DELIVERY**
  - 1 - 3 weeks: chilled
  - Once a day or more: Chilled

**NON-STOCKABLE PRODUCTS**

- Frequency: frozen
**Five Forces Analysis: Dairy Farmers**

### Threat of New Entrants

- Huge capital as well as knowledge investment in processing requires a high tech facility run by highly skilled engineers and a testing lab and R&D facilities run by highly skilled nutrition and microbiology experts.
- The huge capital and knowledge investment require economies of scale at the level of raw milk production as well as processing.

### Rivalry Among Existing Competitors

- The rise in disposable income of the growing middle income population in developing countries represent an emerging potential market for milk protein concentrates as is the case for a range of other consumer products. Competition to capture this market is likely to increase.

### Bargaining Power of Suppliers

- Prices of feed one of the main drivers of industry profitability
- Grass-fed dairy-farms are the least dependent, however often still have need for concentrate supplemental feeds e.g. soy bean meal for protein or corn for energy

### Bargaining Power of Buyers

- Milk protein concentrates have some characteristics of pharmaceuticals, consumers have relatively little technical knowledge reducing their bargaining power
- Availability of plant based and less processed substitutes will increase consumers bargaining power as health awareness increases, particularly in developed countries.

### Threat of Substitute Products

- There are already a number of substitutes sources of protein e.g. egg while protein concentrates, beef protein, plant protein concentrates such as soy protein, rice protein, Pea Protein, etc.
- Increasing health awareness is likely to shift consumers preference towards plant based and less processed protein concentrates, particularly in the developed world.

### Storage Temp

<table>
<thead>
<tr>
<th>Dry</th>
<th>NUTRACEUTICALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
Five Forces Analysis: Dairy Farmers (cont…)

Is the segment profitable?

From the point of view of the farmer, the segment is highly sophisticated. Vertically integrating processing is probably not viable.

Who Retains The Profit?

If the farmer joins this segment as a supplier of raw milk, the processor will have stronger bargaining power and will retain most of the profit. Probably this is due to the high knowledge and capital investment required to separate protein components that give the product its attribute as concentrated milk powder.
**Consumer Demand**
There must be proven demand for this type of product.

**Required certification and Food Safety Standards**
All minimum, hygiene and food safety standards must be met.

**Proper Labeling**
With increasing health awareness proper labeling is key for the marketing of any food item. Proper labeling even more important for nutraceutical products given their similarities with pharmaceuticals where consumers have limited technical knowledge of product components.

**Degree of Natural/Organic Contents**
With increasing health awareness consumers prefer more natural products.

**Cost**
Retailer decisions will likely be cost-driven.

**Appropriate, Durable Packaging**
Packaging must be appropriate and durable.
Typical Generic Strategy

Being a technology/knowledge intensive product, the best strategy to reap profit from investment on high tech facilities is to differentiate products. i.e., supply a product with unique attributes perceived by consumers to be better at providing nutrients.
Key Success Factors

- Consistency of raw milk test through controlling cows dietary intake as well as lactation schedules
- Large scale and uninterrupted supply of raw milk
- Proximity of raw milk supply source to processing plant and sophisticated collection centers and transportation facilities
- A high tech processing facility with well equipped testing labs and R&D facilities
- Access to high skilled manpower in the local market; skilled process engineer to run processing and nutritionist and microbiologist to run R&D and testing labs.
- Efficiency in by product and waste product management; separating protein components from milk involves by products such as cream, lactose and water. Proper utilization of these products improves cost effectiveness.
- Internationally recognized and certification agencies to verify quality of dairy products
- Readily available supplemental feeds e.g. soy bean meal for protein or corn for energy at competitive prices
- Means to procure dairy-farming and processing machinery, high-yield breeds and packaging materials from the international market
- Efficient international freight forwarding and port services.
Ideal Value Chain – **Stockable, Dry Nutraceutical Products**

**LOCAL**
(<1 day by road)

**NATIONAL**
(2-3 days by road)

**REGIONAL**
(<1 week by road)

**GLOBAL**

**Description of Activities**

<table>
<thead>
<tr>
<th>Colour Code</th>
<th>Description of Activities</th>
</tr>
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<tbody>
<tr>
<td>MILK PRODUCTION</td>
<td></td>
</tr>
<tr>
<td>VET SERVICES</td>
<td></td>
</tr>
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<td></td>
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<tr>
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<tr>
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</tr>
<tr>
<td>POINT OF SALE / RETAIL</td>
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</tr>
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</table>

**Storage Temp**

- **Dry**

**Colour Code**

- **N-RES**
- **KNL**
- **CAP**
- **LAB**
- **ENR**

**Does not include info on time and info intensity**
### ANALYSIS: STOCKABLE, DRY, INDULGENT PRODUCTS NOT REQUIRING FREQUENT DELIVERY

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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>frozen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chilled</td>
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<td></td>
<td></td>
</tr>
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</table>

**FREQUENCY OF DELIVERY**
- 1 - 3 weeks
- Once a day or more

**STOCKABLE PRODUCTS**

**NON-STOCKABLE PRODUCTS**

**NOTE:** The table highlights the frequency of delivery and storage temperatures for stockable, dry, indulgent products not requiring frequent delivery.
Five Forces Analysis (Dairy Farmers)

**THREAT OF NEW ENTRANTS**  
**MEDIUM / STABLE**  
- On the one hand: high barriers for new players in dairy / advanced techniques taking time, skill and money to acquire / cattle bred to produce high quality yields (nutrients, omega 3 fatty acids), & reared in specific way  
- On the other hand: medium challenge for certain existing farmers to switch to organic

**BARGAINING POWER OF SUPPLIERS**  
**MEDIUM / STABLE**  
- Prices of feed one of the main drivers of industry profitability but cows in organic dairy farms are supposed to be mostly grass-fed  
- Use of pesticide, antibiotics must be kept low but need to source specific feed (GM-free)  
- High quality monitoring and techniques necessary to maintain quality and demonstrate compliance and traceability

**RIVALRY AMONG EXISTING COMPETITORS**  
**MEDIUM / STABLE**  
- Low exposure to international competition but potential glut in certain local markets especially when organic price premium is seen to warrant the switching cost from regular to organic dairy farming (booms and busts)  
- Competition with organic milk powder from export regions like New Zealand and EU in fast-growing import regions

**BARGAINING POWER OF BUYERS**  
**MEDIUM / DECREASING**  
- Monopsony of the processor balanced by the need to source from organic certified suppliers  
- Increasing demand for health conscious, high quality, traceable products from retailers

**THREAT OF SUBSTITUTE PRODUCTS**  
**MEDIUM / STABLE**  
- On the one hand: taste perception / emphasis on health supporting growth of organic milk (e.g. organic sourcing policies for public procurement in some EU countries, coffee shop chains shifting to organic for CSR)  
- On the other hand: marked increase in the consumption of milk alternatives / growth of "natural" products with less stringent controls
### Five Forces Analysis (Dairy Farmers)

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### Indulgence

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<th>STORAGE TEMP</th>
<th>STOCKABLE</th>
<th>INDULGENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N/A</td>
<td>DRY</td>
<td>✔</td>
</tr>
</tbody>
</table>

### Is the segment profitable?

Segment is relatively profitable as organic certification grants a premium and barriers to entry are relatively high for greenfield farms. However, rivalry could increase if milk prices stay depressed and the organic premium seems worth switching from regular dairy farming for existing farmers.

### Who Retains The Profit?

Farmer retains relatively more power vis-à-vis buyers and consequently retains a greater share of the profit that is perhaps seen in other segments.
**Consumer Demand**
There must be proven demand for the product or for this type of product.

**Required Food Safety Standards**
All minimum, hygiene and food safety standards must be met.

**Required Certification**
Organic certification standards must be met and certification granted.

**Cost**
Retailer decisions will likely be cost-driven.

**Appropriate, Durable Packaging**
Packaging must be appropriate and durable.
Milk and other products in this segment are differentiated thanks to organic certification (i.e. health and environment conscious consumers).

Markets can be global for markets without organic milk production and are typically national for producer countries.
Key Success Factors

• Space, grass for feeding and irrigation
• Milk production capacity meeting minimum quality standards for organic milk
• Quality of farming management and techniques to follow the requirements imposed to receive the organic certification (e.g. very low use of pesticides, emphasis on cow welfare, protection of fresh water and soils...)
• Strong veterinary services capability locally (lower use of drugs and antibiotics than in other segments)
• Very sophisticated collection and distribution services with refrigeration
• Internationally recognized certification agencies to verify and enforce organic certification
• Readily available supplemental GM-free feeds at competitive prices
• Means to procure safe, high-quality packaging
• Means to procure dairy-farming and processing machinery from the international market
• Means to procure high-yield breeds from international markets
• Means to invest in branding and marketing to generate demand for organic product
Ideal Value Chain – Stockable, Dry Indulgent Products

**Local**
- (<1 day by road)

**National**
- (2-3 days by road)

**Regional**
- (<1 week by road)

**Global**

**Colour Code**
- KNL: Knowledge
- CAP: Concepts
- N-RES: Non-research

**Description of Activities**

- **STOCKABLE**
- **STORAGE TEMP**
- **INDULGENCE**

**FREQUENCY OF DELIVERY**

- LOCAL: (≤1 day by road)
- NATIONAL: (2-3 days by road)
- REGIONAL: (<1 week by road)
- GLOBAL:

**STORAGE TEMP**

- LOCAL: N/A
- NATIONAL: DRY
- REGIONAL: DRY
- GLOBAL: DRY

**INDULGENCE**

- LOCAL: Stockable, Dry Indulgent Products
- NATIONAL: Stockable, Dry Indulgent Products
- REGIONAL: Stockable, Dry Indulgent Products
- GLOBAL: Stockable, Dry Indulgent Products

**Colour Code**
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**Description of Activities**

- **MILK PRODUCTION**
  - KNL
  - CAP

- **VET SERVICES**
  - KNL

- **MACHINERY MAINT'CE**
  - KNL
  - LAB

- **COLLECTION SERVICES**
  - CAP
  - KNL
  - ERGY

- **PROCESSING**
  - ERGY
  - CAP
  - KNL

- **QUALITY INFRA’TURE**
  - KNL

- **PORT SERVICES**
  - KNL
  - CAP
  - N-RES

- **INT’L FREIGHT FRWRDING**
  - KNL
  - N-RES
  - CAP

- **FEED PRODUCTION**
  - N-RES
  - CAP
  - KNL

- **BREEDING / R&D**
  - KNL
  - CAP

- **DAIRY FARMING MACHINERY**
  - CAP
  - KNL

- **PROCESSING MACHINERY**
  - CAP
  - KNL

- **PACKAGING PRODUCTION**
  - CAP
  - KNL

- **BRANDING & MARKETING**
  - KNL

- **DISTRIBUTION**
  - CAP
  - LAB
  - KNL

**Point of Sale / Retail**

- Other Ingr.
  - N-RES
  - KNL

**Does not include info on time and info intensity**
Farm management and farming techniques are critical to follow the requirements imposed to receive the organic certification (e.g. very low use of pesticides, emphasis on cow welfare, protection of fresh water and soils…). More support is needed from veterinary services due to the lower use of drugs and antibiotics and animal feed needs to be GM-free. A national certification agency that is recognized locally and internationally also plays a key role in ensuring that being labelled organic gives the product a premium in the eyes of consumers.
## ANALYSIS: GENERIC STOCKABLE FROZEN PRODUCTS FOR NUTRITION

<table>
<thead>
<tr>
<th>STORAGE TEMP</th>
<th>NUTRITION-DRIVEN</th>
<th>NUTRICEUTICAL-DRIVEN</th>
<th>INDULGENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>dry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FREQUENCY OF DELIVERY</strong></td>
<td>frozen</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>1 - 3 weeks</td>
<td>chilled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once a day or more</td>
<td>Chilled</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**STOCKABLE PRODUCTS**

**NON-STOCKABLE PRODUCTS**

**WORLD BANK GROUP**

**Trade & Competitiveness**

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THREAT OF NEW ENTRANTS
STABLE → INCREASING

- Global trends show a decrease in the total number of dairy producers, but an increase in the intensification of dairy farming—however, in many developing markets, there is an increase in demand for frozen goods that is driving investment in increased productivity and product development.
- Requires large capital investment in machinery and some specialist knowledge.
- Requires large market, access to distribution channels, and low-cost cold chain logistics.

BARGAINING POWER OF SUPPLIERS
INCREASING

- Prices of feed are one of the main drivers of dairy profitability.
- Other inputs at the milk production stage, including genetics and artificial insemination, are increasingly sophisticated and expensive.
- Machinery and logistics systems are increasingly complex, costly, and require new skills in production.

RIVALRY AMONG EXISTING COMPETITORS
STABLE → INCREASING

- A farmer’s rivalry in this segment has traditionally been determined by proximity to production, however, foreign direct investment and investment in cold chains has broadened the competitive landscape and increased the number of competitors in local markets.
- Lowest-cost production and an ability to experiment with multiple products results in comparative advantage.
- Low customer loyalty.

THREAT OF SUBSTITUTE PRODUCTS
STABLE → INCREASING

- Milk powder is a common substitute for raw milk in generic ice cream production.
- Substitute products are more widely available in developed markets, including a growing number of healthier, more indulgent frozen desserts.
- Low cost to change to other available sweets/snacks, but relatively few cold and frozen alternatives.

BARGAINING POWER OF BUYERS
STABLE → INCREASING

- The leverage of large downstream retail buyers may cause upstream price constraints.
- An increasing number of large institutional buyers will reduce negotiating power.
- Low costs of changing, few differences between competitors.
- Often reliant on processor to provide freezers in stores.
### Is the segment profitable?

Margins may be small in this segment for an individual farmer, but substantial profits can be made through the processing and distribution of these products. A ‘frozen’ cold chain, even if only very basic, is essential for market penetration.

### Who retains the profit?

Due to the availability of milk powder on the global market, processing does not necessarily require locally produced milk. Large (often multinational) processors dominate this segment, and the highest margins are likely to be captured in the final products.

---

**Five Forces Analysis: Dairy Farmer (cont…)**

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<tr>
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<tr>
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**Is the segment profitable?**

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**Who retains the profit?**

Due to the availability of milk powder on the global market, processing does not necessarily require locally produced milk. Large (often multinational) processors dominate this segment, and the highest margins are likely to be captured in the final products.
Buyer Purchasing Criteria for Stockable Frozen Products

- Hygienic tests during collection and processing
  - Organoleptic tests
    - Freshness (odor), consistency of color, taste
  - Gerber Butterfat test or lactometer test
    - Total solids (TS) or milk fat content - approx. 2.9-3.6%, but can be lower or significantly higher
    - Solids non-fat (SNF) content – generally should not be below 8.5%
  - Somatic cell count – pathogens
  - Additional possible testing:
    - Resazurin test – hygiene
    - Clot on Boiling (C.O.B) Test – acidity (colostral/mastitis)
    - Standard Plate Count (SPC) – total number of aerobic bacteria
    - Preliminary Incubation Count (PIC) – bacteria (mastitis)
    - Inhibitor test – drug or pesticide residues
    - Freezing Point Determination – adulteration and water content
    - Alcohol or Alcohol-Alizarin test – levels of albumen (colostrum milk) and salt concentrates (mastitis)

- Minimum necessary standards and certification from the host market government
- Consumer demand (brand recognition)
- Cost
- Size/durability of packaging
- Provision and/or ownership of freezers at point of sale
The most successful farmers in this segment are vertically integrated and likely to produce a multitude of dairy (and/or snack) products sold nationally or regionally. These dairies compete on economies of scale, based on consistent access to milk powder and/or fresh milk.
Key Success Factors for Dairy Farmers in this Segment

- Ability to individually produce, or contribute within the catchment area of a cooperative/processor, a minimum of **10,000 liters of milk per day**
  - Medium to large herd of high-yielding cattle (individually or collectively owned)
  - Access to sufficient, high-quality, and inexpensive feed and feed additives
  - Consistent, high fat content milk **OR** access to consistent milk powder
  - Access to essential services (e.g., management, IT, veterinary, collection, maintenance, waste)
- Access to processing, which is likely to require large up-front capital expenditure (either individually or collectively) and the necessary access to finance
- Chilling and freezing capacity/storage, especially at point of sale
- World-class efficiency in production and management
- Efficient, low-cost logistics (e.g., collection, distribution)
- Access and distribution channels to national or regional markets, including large buyers
- Effective marketing, advertising, and branding
- Accurate market information (e.g., consumer preferences/research)
## ANALYSIS: INDULGENT STOCKABLE FROZEN PRODUCTS

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</table>

- **STOCKABLE PRODUCTS**
- **NON-STOCKABLE PRODUCTS**

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![Image of Häagen-Dazs Secret Sensations Chocolat Fondant](image-url)
**Five Forces Analysis (Dairy Farmers)**

### Threat of New Entrants
**LOW / STABLE**
- Emphasis on local sourcing from buyers limiting the potential for new entrants
- Need to demonstrate sustainable practices while being small (emphasis on small farms <40 cows), which requires efficient management, using cattle bred to produce high yields and adequate content

### Rivalry Among Existing Competitors
**LOW / STABLE**
- Emphasis on fresh milk, precluding the use of milk powder
- Farms have to be located near the plant – only the farms in a defined catchment area are competing (<50 km) – small and have sustainable operations

### Threat of Substitute Products
**HIGH / INCREASING**
- Numerous alternatives in the luxury / indulgence desserts space (e.g. high-end cakes, cookies, chocolates, …)
- Growing emphasis on health conscious eating patterns – frozen space of supermarkets referred to as the “morgue” because of drive toward fresh produce and freshly prepared food

### Bargaining Power of Buyers
**MEDIUM / DECREASING**
- Monopsony of the processor (largest buyer by far of fresh milk in plant catchment area) balanced by the need to respond to threat of substitutes driving the mounting emphasis on purity and authenticity, fresher ingredients and creating a smaller carbon footprint (i.e. need to source milk from local, small, sustainable farms)

### Bargaining Power of Suppliers
**MEDIUM / INCREASING**
- Prices of feed, one of the main drivers of industry profitability
- Grass-fed dairy-farms are the least dependent, however often still have need for concentrate supplemental feeds e.g. soy bean meal for protein or corn for energy
- High quality monitoring and techniques necessary to maintain quality and traceability

---

**Frequency of Delivery**
- **STOCKABLE**
- **FROZEN**
- **INDULGENCE**
- **STORAGE TEMP**
- **N/A**
### Five Forces Analysis (Dairy Farmers)

<table>
<thead>
<tr>
<th>FORCE</th>
<th>LOW / STABLE</th>
<th>MEDIUM / DECREASING</th>
<th>MEDIUM / INCREASING</th>
<th>HIGH / INCREASING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THREAT OF NEW ENTRANTS</strong></td>
<td>Emphasis on local sourcing from buyers limiting the potential for new entrants [\text{Emphasis on sustainable practices on small farms}]</td>
<td>[\text{Emphasis on small farms &lt;40 cows}] [\text{Managing efficient cattle bred to produce high yields and adequate content}]</td>
<td>[\text{Emphasis on fresh milk, precluding the use of milk powder}]</td>
<td>[\text{Emphasis on fresh milk, precluding the use of milk powder}]</td>
</tr>
<tr>
<td><strong>RIVALRY AMONG EXISTING COMPETITORS</strong></td>
<td>[\text{Competitors have to be located near the plant – only the farms in a defined catchment area are competing (&lt;50 km)}] [\text{Small and have sustainable operations}]</td>
<td>[\text{Small and have sustainable operations}]</td>
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</tr>
<tr>
<td><strong>THREAT OF SUBSTITUTE PRODUCTS</strong></td>
<td>[\text{Numerous alternatives in the luxury / indulgence desserts space (e.g. high-end cakes, cookies, chocolates…)}] [\text{Growing emphasis on health conscious eating patterns} [\text{Frozen space of supermarkets referred to as the “morgue” because of drive toward fresh produce and freshly prepared food}]</td>
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<tr>
<td><strong>BARGAINING POWER OF BUYERS</strong></td>
<td>[\text{Monopsony of the processor (largest buyer by far of fresh milk in plant catchment area)}] [\text{Balanced by the need to respond to threat of substitutes driving the mounting emphasis on purity and authenticity, fresher ingredients and creating a smaller carbon footprint} [\text{Prices of feed one of the main drivers of industry profitability}]</td>
<td>[\text{Prices of feed one of the main drivers of industry profitability}]</td>
<td>[\text{Grass-fed dairy farms are the least dependent, however often still have need for concentrate supplemental feeds e.g. soybean meal for protein or corn for energy}]</td>
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</tr>
<tr>
<td><strong>BARGAINING POWER OF SUPPLIERS</strong></td>
<td>[\text{High quality monitoring and techniques necessary to maintain quality and demonstrate traceability}]</td>
<td>[\text{High quality monitoring and techniques necessary to maintain quality and demonstrate traceability}]</td>
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<td>[\text{High quality monitoring and techniques necessary to maintain quality and demonstrate traceability}]</td>
</tr>
</tbody>
</table>

### Is the segment profitable?

Segment is relatively profitable as competition is extremely ‘local’ and there are relatively high barriers to entry. However, strong threat of substitutes for the end product and need to be fortunate enough to be one of the farmers within the processor’s catchment area.

### Who Retains The Profit?

Farmer retains relatively more power vis-à-vis buyers and consequently retains a greater share of the profit that is perhaps seen in other segments.
Advanced Buyer Purchase Criteria

Consumer Demand
There must be proven demand and willingness to pay a premium for the product.

Required Certification and Food Safety Standards
Hygiene and food safety standards must be met.

Sustainability and Traceability
Growing emphasis from consumers on the ability to demonstrate sustainability and traceability.

Reliable Cold Chain
Retailers typically have strict guidelines as to the minimum and maximum temperatures of the product at the point of reception.

Appropriate, Durable Packaging
Packaging must be appropriate and durable.
Typical Generic Strategy

Dairy products in this segment seek to maximize differentiation.

Markets are typically regional / global but catchment area for milk sourcing is local for differentiation purposes.
Key Success Factors

- Geographical location within 50 to 100 miles of dairy processing facility producing premium products
- Space, grass for feeding and irrigation
- Milk production capacity meeting minimum quality standards of the processor
- Quality of farming management and techniques to demonstrate farming sustainability according to processor’s requirements
- Vet services, machinery maintenance capability locally
- Safe, high-quality packaging made in the vicinity of the processing plant (sustainability differentiation)
- Very sophisticated collection and distribution services with refrigeration
- Retail points with dedicated/reserves refrigeration space appropriate for frozen products
- Internationally recognized certification agencies to verify quality of dairy products
- Readily available supplemental feeds e.g. soy bean meal for protein at competitive prices
- Means to procure dairy-farming and processing machinery from the international market
- Means to procure high-yield breeds from international markets
- Means to procure high-end other ingredients from niche sources from across the globe
- Means to invest heavily in branding and marketing to generate global demand for the end product
Ideal Value Chain – **Indulgent, Stockable, Frozen Products**

**LOCAL**
- **(<1 day by road)**

**NATIONAL**
- **(2-3 days by road)**

**REGIONAL**
- **(<1 week by road)**

**GLOBAL**

**Colour Code**
- Icon: Description of Activities

**FREQUENCY OF DELIVERY**
- **STOCKABLE**
- **N/A**
- **FROZEN**

**STORAGE TEMP**
- **INDULGENCE**

**INDULGENCE**
- **Stockable, Frozen Products**

**GENERAL**

- **Distribution**
- **Point of Sale / Retail**
- **Branding & Marketing**
- **Quality Infrastructure**
- **Packaging Production**
- **Processing**
- **Collection Services**
- **Machinery Maintenance**
- **Vet Services**
- **Milk Production**
- **Quality Feed Production**
- **Breed/ R&D**
- **Processing Machinery**
- **Other Ingredients Provision**
- **Dairy Farming Machinery**
- **Feed Production**
- **Int’l Freight Forwarding**
- **Port Services**
- **Quality Infrastructure**

**FLOW**
- **Collection Services**
- **Processing**
- **Packaging Production**
- **Distribution**
- **Point of Sale / Retail**

**STOCKABLE**
- **N/A**

**FROZEN**
- **✓**

**SUMMARY**

- Colour codes indicate different activities and their related functions in the value chain.
- The image does not include information on time and info intensity.

**KEY**

- N-RES: Not relevant
- CAP: Core activity
- KNL: Knowledge network
- LAB: Laboratory
- ERG: Energy
- N/A: Not applicable

**NOTES**

- The image provides a visual representation of the value chain for indulgent, stockable, frozen products, highlighting the frequency of delivery and storage temperature across different regions.
The geographical location of the farm is critical for milk production, as the farm needs to be close to the processing plant to qualify as a supplier. The quality of the milk and the sustainability of farming techniques are also key and require specific management skills.

Locally sourced packaging is encouraged, while very high end ingredients are sourced from the specific locations across the globe where they are deemed to be of the highest quality (e.g. vanilla from Madagascar, coffee from Brazil...). Finally, branding and marketing play a key role.
<table>
<thead>
<tr>
<th>STORAGE TEMP</th>
<th>NUTRITION-DRIVEN</th>
<th>NUTRICEUTICAL-DRIVEN</th>
<th>INDULGENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>dry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frozen</td>
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<td></td>
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</tr>
<tr>
<td>1 - 3 weeks</td>
<td>Chilled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once a day or more</td>
<td>Chilled</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
THREAT OF NEW ENTRANTS
DECREASING

- Global trends show a decrease in the total number of dairy producers, but an increase in the intensification of dairy farming.
- The necessary market access, land area, access to feed, specialized knowledge, and machinery are strong barriers to entry.
- Access to distribution channels requires reliable and low-cost cold chain logistics and access to affordable packaging.

BARGAINING POWER OF SUPPLIERS
INCREASING

- Prices of feed are one of the main drivers of dairy profitability.
- Other inputs at the milk production stage, including genetics and artificial insemination, are increasingly sophisticated and expensive.
- Machinery and logistics systems are increasingly complex, costly, and require new skills in production.
- Efficient logistics services are critical.

RIVALRY AMONG EXISTING COMPETITORS
STABLE

- A farmer’s rivalry in this segment has traditionally been determined by proximity to production, however, due to the fact that these products have longer shelf-lives and can be shipped around the world, the competitive landscape has grown much wider.
- Lowest-cost production results in comparative advantage, minimal differences in quality and little consumer loyalty.

THREAT OF SUBSTITUTE PRODUCTS
STABLE - INCREASING

- Raw milk and cream are still a necessary ingredients in the production of cheese and butter. So, even if the dairy farmer is only selling to a processor, there is still no substitute for raw milk as a component in the final products of this segment.
- Cheese and butter are still key components in cooking and other processed foods, although substitutes to butter are growing.
- Other cheap cheese snack products do compete with all other snack items, and those that do not require refrigeration may have a cost/shelf-life advantage.
- Milk products in this segment compete with longer-shelf life products like UHT milk and milk powder in many markets.

BARGAINING POWER OF BUYERS
STABLE - INCREASING

- The leverage of large downstream retail buyers may cause upstream price constraints.
- An increasing number of large institutional buyers will reduce negotiating power.
- Low costs of changing, few differences between competitors.
- Relatively inelastic demand in developed countries.
Is the segment profitable?

Margins are small in this segment for the individual dairy farmer. Processing of these products requires large capital investment, economies of scale, and cold chain logistics. However, it can be profitable.

Who retains the profit?

Large, vertically integrated processors dominate this segment. The highest margins are likely to be captured in the final products (or services, e.g. at the restaurant level). A vertically integrated processor is likely to capture more profit than an individual dairy farmer or non-integrated processor, but takes on considerably higher costs and risks.

<table>
<thead>
<tr>
<th>FREQUENCY OF DELIVERY</th>
<th>STORAGE TEMP</th>
<th>NUTRITION-DRIVEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>STOCKABLE</td>
<td>1-3 WEEKS</td>
<td>CHILLED</td>
</tr>
</tbody>
</table>
Buyer Purchasing Criteria for Stockable, Chilled Products

- Hygienic tests during collection and processing
  - Organoleptic tests
    - Freshness (odor), consistency of color, taste
  - Gerber Butterfat test or lactometer test
    - Total solids (TS) or milk fat content - approx. 2.9-3.6%, but can be lower or significantly higher
    - Solids non-fat (SNF) content – generally should not be below 8.5%
  - Somatic cell count – pathogens
  - Additional possible testing:
    - Resazurin test – hygiene
    - Clot on Boiling (C.O.B) Test – acidity (colostral/mastitis)
    - Standard Plate Count (SPC) – total number of aerobic bacteria
    - Preliminary Incubation Count (PIC) – bacteria (mastitis)
    - Inhibitor test – drug or pesticide residues
    - Freezing Point Determination – adulteration and water content
    - Alcohol or Alcohol-Alizarin test –levels of albumen (colostrum milk) and salt concentrates (mastitis)
- Minimum necessary standards and certification from the host market government
- Consumer demand (brand recognition)
- Cost
- Size/durability of packaging and requisite distribution protocol (e.g., sorting/separating)
- Shelf-life
The most successful farmers in this segment are vertically integrated, rely on efficiency and economies of scale, and likely to produce a multitude of dairy (and/or snack) products at multiple facilities around the world.
Key Success Factors for Dairy Farmers in this Segment

- Ability to individually produce, or contribute within the catchment area of a cooperative/processor, a minimum of **50,000 liters of milk per day**
  - Large herd of high-yielding cattle (individually or collectively owned)
  - Access to sufficient, high-quality, and inexpensive feed and feed additives
  - Consistent, high fat content milk
  - Access to essential services (e.g., management, IT, veterinary, collection, maintenance, waste)
- Access to processing, which is likely to require large up-front capital expenditure (either individually or collectively) and the necessary access to finance
- Reliable chilling capacity/storage throughout cold chain
- World-class, efficient, low-cost logistics (e.g., collection, distribution, freight forwarding)
- Access and distribution channels at national/regional/global level, especially large buyers
- Effective marketing, advertising, and branding
- Accurate market information and risk management strategies
Ideal Value Chain – Stockable, Chilled Products, delivery <3 wks

LOCAL
(<1 day by road)

- MILK PRODUCTION
- VET SERVICES
- MACHINERY MAINT'CE
- COLLECTION SERVICES
- PROCESSING

NATIONAL
(2-3 days by road)

- FEED PRODUCTION
- QUALITY INFRA'TURE
- PORT SERVICES
- INT'L FREIGHT FRWRDING
- OTHER INGREDIENTS PRODUCTION
- PACKAGING PRODUCTION
- POINT OF SALE / RETAIL
- DISTRIBUTION

REGIONAL
(<1 week by road)

- BRANDING & MARKETING

GLOBAL

- BREEDING / R&D
- DAIRY FARMING MACHINERY PRODUCTION
- PROCESSING MACHINERY PRODUCTION

FREQUENCY OF DELIVERY: STOCKABLE - 1-3 WEEKS
STORAGE TEMP: CHILLED
NUTRITION-DRIVEN: ✔️

Colour Code: Description of Activities

- N-RES: Neutral Residual
- KNL: Knowledgeable
- CAP: Committed to Action
- ENR: Equal to None
- LAB: Learned by Animation

DOES NOT INCLUDE INFO ON TIME AND INFO INTENSITY
### ANALYSIS: STOCKABLE CHILLED NUTRICEUTICAL PRODUCTS, REQUIRING DELIVERY EVERY 1-3 WEEKS

<table>
<thead>
<tr>
<th>STORAGE TEMP</th>
<th>NUTRITION-DRIVEN</th>
<th>NUTRICEUTICAL-DRIVEN</th>
<th>INDULGENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>dry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FREQUENCY OF DELIVERY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>frozen</td>
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</tr>
<tr>
<td>1 - 3 weeks</td>
<td>chilled</td>
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</tr>
<tr>
<td>Once a day or more</td>
<td>Chilled</td>
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</tbody>
</table>

**Stable Stockable Chilled Nutriceutical Products:**
- Frequency of Delivery: 1-3 weeks
- Storage Temperature: Chilled
**Five Forces Analysis (Dairy Farmers)**

### Threat of New Entrants

**Stable**
- Although the production of probiotics requires some degree of sophistication in terms of laboratory facilities, however it hardly as huge and sophisticated as in the case of protein concentrates.
- Therefore relatively smaller barrier to entry.

### Rivalry Among Existing Competitors

**Increasing**
- The rise in disposable income of the growing middle income population in developing countries represent an emerging potential market for milk probiotics as is the case for a range of other consumer products. Competition to capture this market is likely to increase.

### Bargaining Power of Suppliers

**Increasing**
- Prices of feed one of the main drivers of industry profitability.
- Grass-fed dairy-farms are the least dependent, however often still have need for concentrate supplemental feeds e.g. soy bean meal for protein or corn for energy.

### Bargaining Power of Buyers

**Increasing**
- Probiotics do not have the nature of pharmaceuticals as in the case of protein concentrates. Consumers have better negotiation power.
- Availability of non-dairy based and less processed substitutes will increase consumers bargaining power as health awareness increases, particularly in developed countries.

### Threat of Substitute Products

**Increasing**
- There are a number of alternatives to aid digestion e.g. yogurt, kefir made from plant sources, pickles, probiotic dark chocolates, some varieties of green tea, etc.
- With increasing health awareness, consumers may prefer non-dairy based probiotic products.

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**Stockable Products**

<table>
<thead>
<tr>
<th>FREQUENCY OF DELIVERY</th>
<th>STORAGE TEMP</th>
<th>NUTRACEUTICALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 weeks</td>
<td>chilled</td>
<td>✓</td>
</tr>
</tbody>
</table>
**Five Forces Analysis for Dairy Farmers**

**Is the segment profitable?**

This segment is not as sophisticated as the protein concentrates market. Potentially possible for small holder farmers and processors to be competitive here e.g. with investment on relatively advanced processing plant (with labs)

**Who Retains The Profit?**

There is potential for farmers to retain profit given that they can engage in the value addition process...
Consumer Demand
There must be proven demand for this type of product

Required certification and Food Safety Standards
All minimum, hygiene and food safety standards must be met.

Proper Labeling
With increasing health awareness proper labeling is key for the marketing of any food item. Proper labeling is important in probiotics for similar reasons.

Degree of Natural/Organic Contents
With increasing health awareness consumers prefer more natural products.

Cost
Retailer decisions will likely be cost-driven

Appropriate, Durable Packaging
Packaging must be appropriate and durable
With relatively small requirement for scale, competing on cost is not a sound strategy. Value addition through differentiation is a more viable strategy to compete in this segment.
Key Success Factors

- Uninterrupted supply of raw milk, large scale is not critical as it is in the protein concentrates segment.
- Consistency of raw milk test through controlling cows dietary intake as well as lactation schedules.
- Proximity of raw milk supply source to processing plant and appropriate collection centers and transportation facilities.
- Some testing lab facility.
- Internationally recognized and certification agencies to verify quality of dairy products.
- Readily available supplemental feeds e.g. soy bean meal for protein or corn for energy at competitive prices,
- Means to procure processing machinery, high-yield breeds and packaging materials from the international market.
- Efficient international freight forwarding and port services with cold chain facilities.
Ideal Value Chain - **Stockable, Frozen Products delivery <3 wks**

- **LOCAL** (<1 day by road)
  - MILK PRODUCTION
  - VET SERVICES
  - MACHINERY MAINT'CE
  - COLLECTION SERVICES
  - PROCESSING
  - DISTRIBUTION

- **NATIONAL** (2-3 days by road)
  - FEED PRODUCTION
  - QUALITY INFRA’TURE
  - PORT SERVICES
  - INT’L FREIGHT FRWRDING
  - OTHER INGREDIENTS PROVISION

- **REGIONAL** (<1 week by road)
  - BRANDING & MARKETING
  - PACKAGING PRODUCTION
  - POINT OF SALE / RETAIL

- **GLOBAL**
  - BREEDING / R&D
  - DAIRY FARMING MACHINERY
  - PROCESSING MACHINERY

**STORAGE TEMP**
- **STOCKABLE**
- **FREQUENCY OF DELIVERY**
  - 1X/1-3 WEEKS
- **CHILLED**

**Colour Code**
- CAP
- KNL
- N-RES
- LAB

**Description of Activities**

- DOES NOT INCLUDE INFO ON TIME AND INFO INTENSITY
### ANALYSIS: INDULGENT STOCKABLE CHILLED PRODUCTS, REQUIRING DELIVERY EVERY 1-3 WEEKS

<table>
<thead>
<tr>
<th>STORAGE TEMP</th>
<th>NUTRITION-DRIVEN</th>
<th>NUTRICEUTICAL-DRIVEN</th>
<th>INDULGENCE</th>
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</thead>
<tbody>
<tr>
<td>dry</td>
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<td></td>
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</tr>
<tr>
<td>frozen</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1 - 3 weeks</td>
<td>chilled</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Once a day or more</td>
<td>Chilled</td>
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</tbody>
</table>

**FREQUENCY OF DELIVERY**

<table>
<thead>
<tr>
<th>USERS / MARKETS</th>
<th>STOCKABLE PRODUCTS</th>
<th>NON-STOCKABLE PRODUCTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>dry</td>
<td></td>
</tr>
<tr>
<td></td>
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<td>✓</td>
</tr>
<tr>
<td></td>
<td>Chilled</td>
<td></td>
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</tbody>
</table>

**STOCKABLE PRODUCTS**

**NON-STOCKABLE PRODUCTS**

**ANALYSIS:**

- **Stockable Chilled Products:**
  - Frequency of delivery: 1-3 weeks
  - Suitable for Chilled Indulgence

**Users/Marks:**

- Suitable for Chilled Indulgence
**Five Forces Analysis (Dairy Farmers)**

**THREAT OF NEW ENTRANTS**

*LOW / STABLE*
- Impossibility to compete unless the farm is located in the area clearly defined by the certificate of origin required to produce and sell the end product

**RIVALRY AMONG EXISTING COMPETITORS**

*LOW / STABLE*
- Need to use fresh milk from a very specific area, precluding the use of milk powder
- Competition is however possible between existing competitors to increase their market share as suppliers for each particular product

**THREAT OF SUBSTITUTE PRODUCTS**

*MEDIUM / DECREASING*
- Some alternatives in the indulgence pre / post dinner snack or ingredients (e.g. other cheeses, nuts, breads, crackers, sweets,...)
- Growing emphasis on authenticity and health supporting the search for quality backed by certificates of origin

**BARGAINING POWER OF SUPPLIERS**

*MEDIUM / INCREASING*
- Prices of feed, one of the main drivers of industry profitability
- Grass-fed dairy-farms are the least dependent, however often still need for concentrate supplemental feeds e.g. soy bean meal for protein or corn for energy
- High quality monitoring and techniques necessary to maintain quality and traceability

**BARGAINING POWER OF BUYERS**

*MEDIUM / DECREASING*
- Monopsony of the processor balanced by the need to source from a very precise area from sustainable suppliers
- Increasing demand for high quality, differentiating products from retailers

**FREQUENCY OF DELIVERY**

**STORAGE TEMP**

**INDULGENCE**

**STOCKABLE**

1-3 weeks  
CHILLED
Is the segment profitable?

Segment is relatively profitable as competition is extremely ‘local’ and there are relatively high barriers to entry. However need to be fortunate enough to be one of the farmers within the certificate of origin’s stipulated area / region.

Who Retains The Profit?

Farmer retains relatively more power vis-à-vis buyers and consequently retains a greater share of the profit that is perhaps seen in other segments.
Consumer Demand
There must be proven demand and willingness to pay a premium for the product

Required Certification and Food Safety Standards
Hygiene and food safety standards must be met

Authenticity and High Quality
Growing emphasis from consumers on authenticity and high quality, which certificates of origin can help demonstrate

Reliable Cold Chain
Retailers typically have strict guidelines as to the minimum and maximum temperatures of the product at the point of reception
Typical Generic Strategy

Dairy products in this segment seek to maximize differentiation.

Markets are typically regional / global but catchment area for milk sourcing is local for differentiation purposes (certificates of origin).
Key Success Factors

- Geographical location strictly within a designated area for the final product to be eligible to receive a premium certificate of origin
- Space, grass for feeding and irrigation
- Milk production capacity meeting minimum quality standards to be eligible for certificate of origin
- Vet services, machinery maintenance capability locally
- Availability of other ingredients and knowledge of processing techniques to make final product protected by certificate of origin
- Sophisticated collection services with refrigeration
- Internationally recognized certification agencies to verify quality of dairy products and enforce recognition of and compliance with certificate of origin rules
- Readily available supplemental feeds e.g. soy bean meal for protein at competitive prices
- Means to procure dairy-farming and processing machinery from the international market
- Means to procure high-yield breeds from international markets
- Means to invest heavily in branding and marketing to generate global demand for the end product
Ideal Value Chain – Stockable, Chilled Products, delivery <3wks

**LOCAL**
(<1 day by road)

**MILK PRODUCTION**
- N-RES
- KNL
- CAP

**VET SERVICES**
- KNL

**MACHINERY MAINT’CE**
- KNL
- LAB

**COLLECTION SERVICES**
- CAP
- KNL

**PROCESSING**
- ERGY
- KNL

**OTHER INGREDIENTS PROVISION**
- N-RES
- KNL

**QUALITY INFRA’TURE**
- KNL

**PORT SERVICES**
- KNL

**INT’L FREIGHT FRW’RING**
- KNL
- N-RES
- CAP

**REGIONAL**
(<1 week by road)

**FEED PRODUCTION**
- N-RES
- CAP
- KNL

**BREEDING / R&D**
- KNL
- CAP

**DAIRY FARMING MACHINERY**
- KNL

**PROCESSING MACHINERY**
- KNL

**PACKAGING PRODUCTION**
- CAP
- KNL

**BRANDING & MARKETING**
- KNL

**GLOBAL**

**STOCKABLE**
- 1-3 weeks

**STORAGE TEMP**
- CHILLED

**INDULGENCE**
- ✓

**FREQUENCY OF DELIVERY**

**STORESTOCK**

**INDULGENCE**

**STOCKABLE**

**INFORMATION INTENSITY**

**COLOUR CODE**

**DESCRIPTION OF ACTIVITIES**

- Ideal Value Chain – Stockable, Chilled Products, delivery <3wks

**DOES NOT INCLUDE INFO ON TIME AND INFO INTENSITY**
The geographical location of the farm is critical for milk production, as the farm needs to be within a designated area for the final product to be eligible to receive a premium certificate of origin. A certification agency needs to operate at a national level and to have the means to ensure that only eligible producers can brand their products using the certificate of origin. Lastly, branding and marketing efforts at a global level will be needed to raise the profile of the certificate of origin and to give it a premium in the eyes of consumers.
### ANALYSIS: PERISHABLE PRODUCTS FOR ‘NUTRITION’ ONLY

<table>
<thead>
<tr>
<th>STORAGE TEMP</th>
<th>NUTRITION-DRIVEN</th>
<th>NUTRICEUTICAL-DRIVEN</th>
<th>INDULGENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>dry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>frozen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 - 3 weeks</td>
<td>chilled</td>
<td></td>
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</tr>
<tr>
<td>Once a day or more</td>
<td>Chilled</td>
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</table>

**FREQUENCY OF DELIVERY**
- Stockable products:
  - Once a day or more: Chilled
- Non-stockable products:
  - 1 - 3 weeks: chilled
Five Forces Analysis (Dairy Farmers)

**Threat of New Entrants**
- Stable
- Large capital investments and investments in branding from incumbents
- Overall high concentration of processors and retailers (rationalizing their supply)

**Rivalry Among Existing Competitors**
- Stable
- Falling demand in China and Russia plus end of EU quotas have led to plummeting milk prices and fierce competition.
- Mature markets for fresh milk (UK, EU, OCEANIA) are stagnating but certain MICS are booming particularly China, India and Pakistan that said shelf life of milk means that very little trade is international

**Bargaining Power of Suppliers**
- Increasing
- Prices of feed one of the main drivers of industry profitability
- Grass-fed dairy-farms are the least dependent, however often still have need for concentrate supplemental feeds e.g. soy bean meal for protein or corn for energy

**Bargaining Power of Buyers**
- Increasing
- Most mature fresh milk markets have almost commoditized fresh milk increasing the power of the buyers
- Increasing concentration of retailers resulting in ever higher bargaining power (price and requirements like traceability and animal welfare).

**Threat of Substitute Products**
- Increasing
- Marked increase in the production and consumption of milk alternatives made from rice, almond, soy, coconut, hazelnut and other non-animal products.
- Also taste of UHT getting closer and closer to that of pasteurized milk and is often cheaper due to bulk production.
- In many markets substitutes also include juice and sodas
Is the segment profitable?

Segment is relatively profitable as competition is extremely ‘local’ and there are relatively high barriers to entry. However strong thread of substitutes.

Who Retains The Profit?

Farmer retains relatively more power vis-à-vis buyers and consequently retains a greater share of the profit that is perhaps seen in other segments, however little bargaining power when it comes to inputs particularly feed.
Advanced Buyer Purchase Criteria

**Consumer Demand**
There must be proven demand for the product of for this type of product

**Required certification and Food Safety Standards**
All minimum, hygiene and food safety standards must be met.

**Short Lead Times**
Retailers in this segment will expect to be able to place orders and receive associated deliveries within 2-3 days.

**Cost**
Retailer decisions will likely be cost-driven

**Reliable Cold Chain**
Retailers typically have strict guidelines as to the minimum and maximum temperatures of the product at the point of reception.

**Appropriate, Durable Packaging**
Packaging must be appropriate and durable
Milk and other products in this segment are not differentiated (i.e. consumed for nutrition only).

Markets are typically national but catchment area is dependent on shelf-life and sophistication of cold-chain logistics.
Key Success Factors

- Space, grass for feeding and irrigation,
- Very high milk production capacity which meets minimum quality standards in country of sale
- High capacity dairy processing facility within 4hrs
- Vet services, machinery maintenance capability locally
- Safe, durable, locally-made packaging (with local prices) also essential
- Very sophisticated collection and distribution services with refrigeration that can monitor location and temperature of milk.
- Retail points with dedicated/reserves refrigeration space for (i.e. not reserved for Coca-cola / Walls products)
- Internationally recognized and certification agencies to verify quality of dairy products
- Readily available supplemental feeds e.g. soy bean meal for protein or corn for energy at competitive prices
- Means to procure dairy-farming and processing machinery from the international market
- Means to procure high-yield breeds from international markets
Ideal Value Chain – Perishable Products for nutrition

**LOCAL**
(<1 day by road)

- MILK PRODUCTION
- MILK PROCESSING
- VET SERVICES
- MACH’RY MAINT’CE
- COLLECTION SERVICES
- DISTRIBUTION
- POINT OF SALE / RETAIL

**REGIONAL**
(<1 week by road)

- FEED PRODUC’N
- NON-DAIRY INGRIED’S

**NATIONAL**
(2-3 days by road)

- PACKAGING PRODUCTION
- QUALITY INFRA-STRUCT’RE

**GLOBAL**

- DAIRY FARMING MACHIN’RY
- PROCES’G MACHIN’RY
- BREEDING / R&D
- BRANDING / MKTG

**Colour Code**

- LAB
- KNL

**Description of Activities**

- Colour
- Code
- Description of Activities

- Ideal Value Chain – Perishable Products for nutrition
- Once a day or more
- chilled

**Does Not Include Info on Time and Info Intensity**
**ANALYSIS: INDULGENT PERISHABLE PRODUCTS**

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**Five Forces Analysis (Dairy Farmers)**

**Threat of New Entrants - Decreasing**
- Luxury / Organic dairy farming requires advanced techniques that take time and skill to cultivate (as well as financial investment).
- Cattle must be bred who produce high quality yields (solid content), high volumes, and who are reared in a manner that is pleasing to potential consumers.
- As pre-prepared products become more popular, higher barriers will arise from:
  - advanced JIT logistics necessary to deliver high quality, traceable luxury milk and dairy products PLUS
  - flexible product offering so as to respond to real-time demand PLUS
  - Close-to-consumer food preparation to make product ‘ready-to-eat’ e.g. Chopping, mixing, dressing etc

**Bargaining Power of Suppliers - Increasing**
- Prices of feed one of the main drivers of industry profitability
- Grass-fed dairy-farms are the least dependent, however often still have need for concentrate supplemental feeds e.g. soy bean meal for protein or corn for energy
- High quality monitoring and techniques necessary to maintain quality

**Rivalry Among Existing Competitors - Stable / Decreasing**
- Competition greatly reduced in comparison to segments serving nutrition or neutriceutical-driven users and markets.
- Whilst nutrition/neutriceutical products are often reliant on milk powder which can be sourced from anywhere in the world, luxury-driven users demanding non-stockable milk products will likely expect fresh milk
- As pre-prepared products become more popular food is likely to be sold relatively close to origin therefore sphere of competition will become more limited

**Bargaining Power of Buyers - Decreasing**
- Luxury, particularly ‘organic’ brands differentiated by origin, treatment of livestock, traceability and type of feed increasingly reduce power of buyers to squeeze farmers

**Threat of Substitutes - Increasing**
- Marked increase in the production and consumption of milk alternatives made from rice, almond, soy, coconut, hazelnut and other non-animal products.
- 30% increase in sales of milk alternatives (compared to 1.8% across entire milk category)
**Is the segment profitable?**

Segment is relatively profitable as competition is extremely ‘local’ and there are relatively high barriers to entry. However strong thread of substitutes.

**Who Retains The Profit?**

Farmer retains relatively more power vis-à-vis buyers and consequently retains a greater share of the profit that is perhaps seen in other segments, however little bargaining power when it comes to inputs particularly feed.

**Threat of New Entrants**

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  - flexible product offering so as to respond to real-time demand PLUS
  - close-to-consumer food preparation to make product ‘ready-to-eat’ e.g. Chopping, mixing, dressing etc.

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Farmer retains relatively more power vis-à-vis buyers and consequently retains a greater share of the profit that is perhaps seen in other segments, however little bargaining power when it comes to inputs particularly feed.
Advanced Buyer Purchase Criteria

Provenance
Provenance and traceability have become increasingly important to consumers

Organic
In some markets (e.g. USA) “organic” is an regulated accreditation that must be approved by a national standards board. However in general, consumers in this segment looking for ‘organic’ varieties will prefer that cows are pasture-raised and grass-fed for a significant period of time each year; that land used for grazing was grown without chemical fertilizers, pesticides or genetically modified seeds; and that herds were not treated with hormones or antibiotics\(^1\).

Fresh
Whilst ‘fresh’ is hard to define, it typically implies that the food has a shelf-life and therefore has not had to be preserved by artificial additives which consumers in this segment tend to reject.

Local
Local sourcing has become increasingly important to consumers as it implies that the product is ‘fresh’ (although in reality there is no correlation). The local food movement is also driven by a growing wish amongst consumers in this segment to support farmers and growers in the community

Environmentally Stable / Neutral
It is often important that farming practices protect natural resources and conserve biodiversity

Food Safety
Although consumers in this segment appear more likely to try ‘new’ brands there is still an expectation that all produce will have meet minimum safety standards

\(^1\)
Players in this segment compete locally.

The products are relatively simple with less focus on extra value added activities (due to the customer base has time to prepare food).

However the products are highly differentiated
Key Success Factors

- Space, grass for feeding and irrigation
- Very high-quality milk production with traceability and highest quality compliance
- Vet services, machinery maintenance capability, collection and distribution services locally
- Retail points with dedicated/reserves refrigeration space for (i.e. not reserved for Coca-cola / Walls products)
- Internationally recognized and respected certification agencies to verify quality of dairy products
- Readily available supplemental feeds e.g. soy bean meal for protein or corn for energy at competitive prices
- Means to procure high-quality breeds of cows
- Means to procure dairy-farming and processing machinery, packaging from the international market
Ideal Value Chain Structure - Indulgent Perishable Products

**LOCAL**
(<1 day by road)

- MILK PROD'ON
- MILK PROC'NG
- VET SERVICES
- MAINT-CE
- COLL’N SERVICES
- DISTRIBUTION
- POINT OF SALE / RETAIL

**NATIONAL**
(2-3 days by road)

- NON-DAIRY INGRIED’S
- QUALITY INFRA’TURE

**REGIONAL**
(<1 week by road)

- FEED PRODUC’N

**GLOBAL**

- DAIRY FARMING MACHIN'RY
- PROCES’G MACH’RY
- PACKAGING PRODUCTION
- BREEDING / R&D

**Colour Code**
- Description of Activities

**FREQUENCY OF DELIVERY**
- NON-STOCKABLE: Once a day or more
- STORAGE TEMP: chilled
- INDULGENCE: non-stocked

- LOCAL:
  - INDULGENCE: once a day or more chilled

- NATIONAL:
  - INDULGENCE: non-stocked

- REGIONAL:
  - INDULGENCE: non-stocked

- GLOBAL:
  - INDULGENCE: non-stocked

**Does not include info on time and info intensity**
## Resource intensity and economies of scale

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge Intensive VC Activities</strong>&lt;br&gt; (training)</td>
<td><img src="image-1" alt="Activity" /></td>
<td><img src="image-2" alt="Activity" /></td>
<td><img src="image-3" alt="Activity" /></td>
</tr>
<tr>
<td><strong>Capital Intensive VC Activities</strong>&lt;br&gt; (investment)</td>
<td><img src="image-4" alt="Activity" /></td>
<td><img src="image-5" alt="Activity" /></td>
<td><img src="image-6" alt="Activity" /></td>
</tr>
<tr>
<td><strong>Labor Intensive VC Activities</strong>&lt;br&gt; (labour % cost)</td>
<td><img src="image-7" alt="Activity" /></td>
<td><img src="image-8" alt="Activity" /></td>
<td><img src="image-9" alt="Activity" /></td>
</tr>
<tr>
<td><strong>Natural Resources</strong>&lt;br&gt; (reliance on environmental factor conditions)</td>
<td><img src="image-10" alt="Activity" /></td>
<td><img src="image-11" alt="Activity" /></td>
<td><img src="image-12" alt="Activity" /></td>
</tr>
<tr>
<td><strong>Energy Intensive VC Activities</strong>&lt;br&gt; (energy % cost)</td>
<td><img src="image-13" alt="Activity" /></td>
<td><img src="image-14" alt="Activity" /></td>
<td><img src="image-15" alt="Activity" /></td>
</tr>
<tr>
<td><strong>With Refrigeration</strong></td>
<td><img src="image-16" alt="Activity" /></td>
<td><img src="image-17" alt="Activity" /></td>
<td><img src="image-18" alt="Activity" /></td>
</tr>
</tbody>
</table>

## Value Chain Linkages by time and information intensity

- **Perishable linkage (4hrs - 4days)**<br>Low information exchange | High Information exchange
- **Just In Time linkage (24-48 hours)**<br>Low information exchange | High Information exchange
- **Made to order linkage (weeks)**<br>Low information exchange | High Information exchange
- **On stock linkage (months)**<br>Low information exchange – High Information exchange
Breeding / R&D: Breeding programs as well as pharmaceutical research for the commercial production of dairy products.

Feed Production: Manufactured / Processed food for dairy herd.

Milk Production: Production of milk for commercial purposes.

Milk Processing: Processing of milk for commercial purposes.

Veterinary Services: Prevention, diagnosis and treatment of disease, disorder and injury in dairy herd.

Processing Machinery: Machinery used for processing milk after collection.

Dairy-Farming Machinery: Machinery used during farming up to farm-gate.

Collection Services: The collection of milk (within 4hrs of milking) to a central area for processing or transportation.

International Freight Forwarding: Person or company that organizes shipments from producer / processor to a final market, secondary producer / manufacture or final point of distribution.

Port Services: Competent management of the movement of ships, containers, and other cargo, the loading and unloading of ships and containers, customs activities through shipping port.

Distribution: Delivery of final product to final point of sale (only).

Point of Sale / Retail: Delivery of final product to final point of sale.

Branding / Marketing / Advertising: Creating large-scale (often international) demand for the final product.

Point of Sale / Retail: Delivery of final product to final point of sale.

Quality Infrastructure: Presence and availability of internationally recognized and respected certification agencies.

Packaging Production: Producers of packaging including boxes, cartons, bags (including under license).

Other Ingredients: Necessary ingredients other than “milk” that are necessary to produce final product.