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Effectiveness of the Value Chain of an Agri-Food Product in Reaching Low Income Consumers: A Business Case Study of Amulspray

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About LANSAs

Leveraging Agriculture for Nutrition in South Asia (LANSA) is an international research partnership. LANSAs is finding out how agriculture and agri-food systems can be better designed to advance nutrition. LANSAs is focused on policies, interventions and strategies that can improve the nutritional status of women and children in South Asia. LANSAs is funded by UKaid from the UK government. The views expressed do not necessarily reflect the UK Government's official policies. For more information see www.lansasouthasia.org

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Abstract

A large section of the population in South Asia is undernourished. Agriculture is the main source of livelihood in the region. Following the framework detailed in Henson and Humphrey (2015), this paper attempts to assess the effectiveness of a dairy milk product (Amulspray), manufactured by a cooperative business, in enhancing consumption of nutritious food by the poor. The case study examines the value chain of Amulspray with focus on the commercial viability of the product and its market outreach, particularly to children from low income households.

The study finds that though the value chain has potential, there are limitations for business-driven value chains to reach vulnerable sections. Institutional environments can play important roles in enabling business-driven value chains to have a pro-nutrition and pro-poor focus.

I. Introduction

The South Asian region houses a large population of undernourished people. Despite rapid economic growth, undernutrition rates in the region remain among the highest in the world. In India, the National Family Health Survey (2015-16) reported that among rural children under age five, 38.4 per cent, 21.0 per cent and 35.7 per cent are stunted, wasted and underweight, respectively (GoI 2016). A large section of the population in India, and in South Asia as a whole, is dependent on agriculture for its sustenance.

Agriculture is a direct source of food and, thereby, nourishment, and there are many analyses of the food value chain from the farm to the fork (Girard et al. 2012; Le Cuziat and Mattinen 2011; Masset et al. 2012). However, there are not many studies on the effectiveness of the agri-food value chain at post-farmgate level and, more so, from the perspective of impacting the nutrition of poor households. Hawkes and Ruel (2011) cite increasing the demand and supply of accessible nutritious foods for the poor (and for different target groups) all year round as the two objectives that value chains for nutrition must satisfy.

With rising populations in developing countries depending on the market for sourcing some or all of their food, understanding the potential that post-farmgate value chains may have in increasing the supply of nutritious foods emerges as an important area of research. Evidence from India and other countries highlights this aspect (Parasar and Bhavani 2016; Maestre et al. 2017). An option to intervene within a value chain is to fortify certain foods with micronutrients at the processing point to make the products more nutrient-dense. Even if the fortification is done by a business with profit as the focus and not necessarily nutritional impact on poor households, the potential for impact on the latter aspect exists. As highlighted by Gillespie et al. (2013:558), 'companies are looking to the base of the pyramid — i.e., to the poorest socioeconomic groups — to expand market share'.

The conceptual framework by Henson and Humphrey (2015) on which this analysis is based, addresses the question: 'What public and private actions are needed to strengthen the impacts of agri-food value chains on nutrition?' i.e., promote 'enhanced access to, and consumption of, nutrient-dense foods by vulnerable population groups'. Consumers at the end of the chain whose 'expenditure and demand preferences drive the chain, and whose nutritional interests are

paramount', are vital players in making this assessment. Three key outcomes are listed as essential for sustained impact: food must be safe to eat on a sustained basis; it must be nutrient-dense at the point of consumption; and it must be consumed in adequate amounts on a sustained basis to bring about the desired nutritional outcomes. A set of nine requirements are also outlined for the success of market-based nutrient-dense agri-food-based value chains: nutrition awareness, signalling, availability, affordability, acceptability, capturing value, incentives along the chain, coordination and governance, and managing costs, risks and uncertainty.

Following the framework summarised above, this paper examines the value chain of a micronutrient-fortified dairy milk product — Amulspray — produced and marketed by a cooperative business, the Gujarat Cooperative Milk Marketing Federation Ltd (GCMMF). It was shortlisted for case study as an example of a pro-nutrition business value chain, from the 40 interventions examined in the India country review of agri-food value chain interventions aimed at enhancing consumption of nutritious food by the poor (Parasar and Bhavani 2016). The main objective is to examine the potential for business-led value chains to have a nutrition focus and reach poor and vulnerable households. In the process, an attempt is made to examine the challenges faced by, and the nature of policy support required, for agri-food value chains in the private sector to have a nutrition focus.

The next section describes the methodology followed for the study; then comes a description of the product and an analysis of its value chain. The findings from the qualitative assessment are discussed in the fourth section, describing the marketing strategy of the company and the use of the product by consumers. Based on this understanding, the value chain of Amulspray is examined in the light of the conceptual framework of Henson and Humphrey (2015) in section five. The limitations and constraints are discussed; the concluding section brings together the key aspects of the study.

2. Methodology

The assessment presented in this paper is based on review of literature and secondary data, as also collection and analysis of primary data from interviews with company officials and a sample of actors at the lower end of the value chain, viz., distributors, wholesalers, retailers and consumers. Desk review was undertaken in early 2015 to collect data from secondary sources of information such as published reports and the internet. This was followed up with a visit to the corporate office of GCMMF in Anand (Gujarat, India) in September 2015 for interviews with the Managing Director and Deputy General Manager (marketing) of the company.

The review of secondary data revealed that eastern India is deficit in milk production,¹ making it an important market for dairy products. Following internal discussion, the state of Odisha in east India and the area around its capital city Bhubaneswar and the neighbouring city of Cuttack were chosen for primary-level qualitative assessment. Qualitative data was collected in December 2015 to understand the use and reach of the product by the consumers and the roles/interactions of the different actors at the consumer end of the value chain. Both rural and urban locations were chosen for the qualitative survey. **Table I** gives details of the key actors in the value chain and the number of people interviewed in each category.

¹ Milk Production by States <http://www.nddb.org/information/stats/milkprodstate>; Per capita availability of Milk by States <http://www.nddb.org/information/stats/percapitavail>

Table 1: Key informant interviews with different value chain actors of Amulspray

	Value Chain Actors	Number Interviewed
1	Company Officials	2
2	Distributors	1
3	Wholesalers	2
4	Retailers	10
5	Consumers	6

In addition, a focus group interaction was conducted with eleven women from consumer households.

3. The Manufacturer and the Product

The white revolution or Operation Flood to increase milk production in India started with Amul, a cooperative of small dairy farmers in Anand, in the state of Gujarat in west India. An initiative nurtured and steered by the late Dr. Verghese Kurien,² Amul is today an established brand in the market; a range of products are manufactured and marketed under the Amul brand by GCMMF, a federation of milk cooperatives in districts of Gujarat. Milk is collected by these cooperatives from about 3.6 million producers/farmers and processed into milk and milk products and marketed. With a large retail marketing network,³ the products have pervasive presence across India, even as they compete with other regional cooperatives and multinational brands. Amul is the largest dairy products company in the country in both milk and milk products, with 30 per cent, 65 per cent and 40 per cent share, respectively, in the branded ghee, cheese and ice cream markets.⁴

3.1. Product and its packaging

Amulspray, one of the products manufactured by GCMMF, is an ‘infant milk substitute’ formulated along WHO guidelines. The mid-twentieth century was a period when India was largely dependent on import of infant foods. There were popular multinational brands like Glaxo in the market. During this period, the Central Food Technological Research Institute (CFTRI), Mysore developed a formulation using buffalo milk that could be fed to infants. This indigenous technology was licensed by the National Research Development Corporation in 1961 to GCMMF. Introduced initially as Amul baby milk powder in the early 1960s, the product was renamed Amulspray, following the introduction of the use of spray drying technology. It was the first time anywhere in the world that baby food was made from buffalo milk on a commercial scale (Chawla 2010). At a time when there was pressure on foreign exchange reserves and the country was following a policy of import substitution, Amulspray captured the domestic market for infant foods.

Amulspray is fortified with various essential micronutrients — vitamins A, D, K, B group, and C as well as minerals calcium, magnesium, phosphorus, iron, copper, manganese and zinc — to support the recommended nutrient intake for children. It has been a well-known brand in the Indian market for over five decades now. Being formulated as an infant milk substitute, there is no cereal

² V Kurien (2005) *I Too Had a Dream* as told to Gouri Salvi, Roli Books

³ It operates through 56 sales offices and has a dealer network of 10000 dealers and 1 million retailers, one of the largest such networks in India: <http://www.amul.com/m/organisation>

⁴ <http://www.businesstoday.in/magazine/cover-story/indian-dairy-market-is-on-a-tear-due-to-new-players/story/232545.html> accessed on 20 January 2017

component in the product. Although the formulation was produced as a complementary feed for infants, it also came to be consumed by older children and as a dairy whitener by adults. The last use is quite popular, as revealed during the course of qualitative interviews with different respondents. For instance:

“...we use it at breakfast and for preparing tea... for various purposes, children, adults, all of us have it. I have three children; the older two have Amulspray while the youngest has Lactogen.” A customer at a retail shop in Bhubaneswar, December 2015

Amulspray being marketed as an ‘Infant Milk Substitute’ came under criticism from NGOs on the ground that that this would discourage breastfeeding. Subsequently, Amul started a promotion campaign emphasising the importance of exclusive breastfeeding for the first six months and the message was conveyed that there is no substitute to breastfeeding. All packs of Amulspray come with an awareness notice displayed on front: ‘*Mother’s milk is best for your baby*’.

To avoid any possible misinformation to buyers of infant foods and in line with the International Code of Marketing of Breastmilk Substitutes adopted by the World Health Assembly of the World Health Organization in 1981,⁵ the Government of India (GoI), in 1992, banned all kinds of promotion or advertisement for infant foods. The IMS Act (Infant Milk Substitutes, Feeding Bottle and Infant Food Regulation of Production, Supply and Distribution Act) 1992 and Amendment Act 2003 prohibit any kind of promotion of baby foods intended for children below 2 years of age. No company can therefore engage in marketing/promotion schemes or advertise any infant food.

The business model of the product has sustained itself for decades though consumer perceptions about the product have been changing. The ban on promotion and advertisement of baby food made the marketing of Amulspray difficult for the company, although by this time it was an established product in the market. The liberalisation of the economy in the early 1990s and the growing penetration of multinationals like Nestlé and Danone in the child food segment have also created a dent in its market share. As of 2015, the baby food segment in India has been dominated by Nestlé with 63 per cent of the market value share.⁶ However, while the multinationals are continually criticised for covert marketing of their products,⁷ Amulspray has focused primarily on the vast market network of the Amul brand of products for reaching out.

Amulspray is available in convenient, affordably priced packages as detailed in **Table 2**

⁵ https://en.wikipedia.org/wiki/International_Code_of_Marketing_of_Breast-milk_Substitutes accessed 17 January 2017

⁶ <http://www.euromonitor.com/baby-food-in-india/report> accessed on 31 May 2016

⁷ <http://www.thehindubusinessline.com/companies/baby-food-majors-misleading-mothers/article4974411.ece> accessed on 31 May 2016

Table 2: Different packs of Amulspray

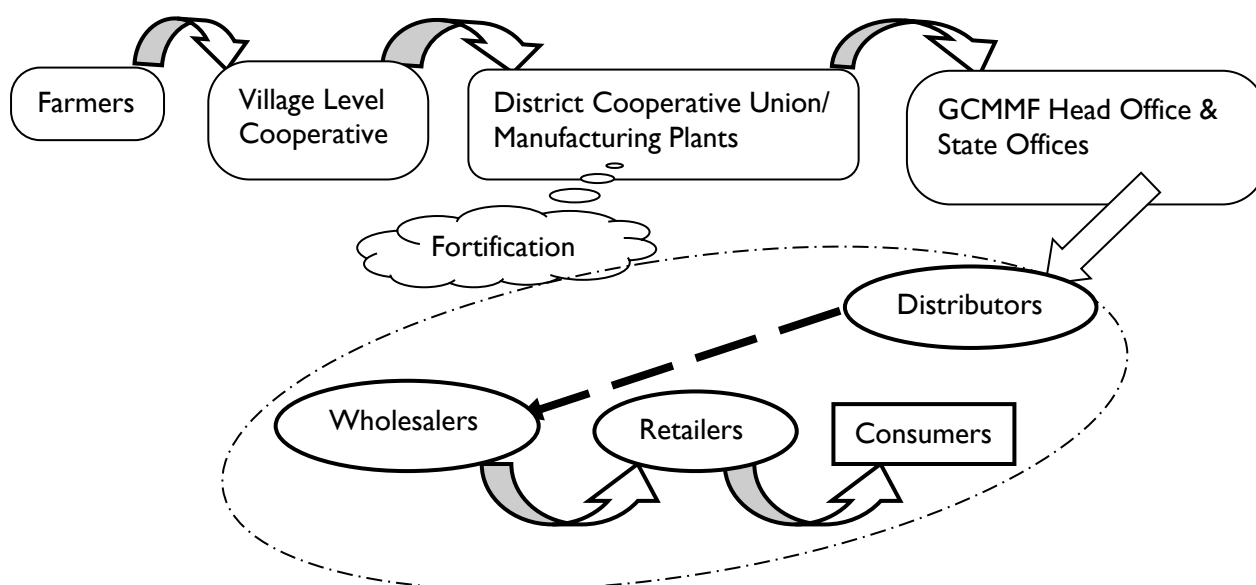
S.No.	Weights	Maximum Retail Price		Remarks
		₹	£ equivalent	
1	1000 g /2.2 lb	357	4.20	Tin can
2	1000 g /2.2 lb	340	4.00	Refill pack
3	500 g/1.1 lb	187	2.20	Tin can
4	500 g/1.1 lb	180	2.10	Refill pack
4	200 g/0.4 lb	72	0.80	Pouch
5	100 g/0.2 lb	37	0.40	Pouch
6	27 g/0.06 lb	10	0.10	Affordable sachet
7	13.5 g/0.03 lb	5	0.06	Affordable sachet

Note: 1£ = ₹ 85/- approximately

3.2. Value chain of Amulspray

Figure 1 illustrates the actors along the Amulspray value chain, viz., the farmers, the village cooperatives, the district cooperative unions, state co-operative marketing federation (GCMMF), Amul's state head offices (depots), distributors, wholesalers, retailers and consumers. The distributor sometimes doubles up as wholesaler and also as retailer in smaller towns.

Figure 1: Value Chain of Amulspray



The producer co-operatives manufacture Amulspray and other milk products; there are 18 member unions covering all the 33 districts of Gujarat state. GCMMF's daily milk procurement is approximately 16.97 million litres per day from 18,545 village milk cooperative societies and 3.6 million milk producer members.⁸ Each milk cooperative union has a production unit and the office of the state cooperative milk marketing federation is at Anand. Amul's website- <http://www.amul.com/m/about-us> has a diagrammatic depiction of the pre-farmgate value chain.

⁸ <http://www.amul.com/m/organisation> accessed on 20 January 2017

The value chain highlights a successful business model characterised by a large number of unorganised (small) suppliers with high market potential; it describes how the small producers, who would otherwise be unable to manage technological changes in their operational processes and gain access to the larger market, benefit from the cooperative structure (Chandra and Tirupati 2003). Amul has used the process of education and social development activities to establish itself with the large base of small farmers.

The milk procured is processed into a wide range of products, including Amulspray, in modern state-of-the-art plants and marketed across India. Amul is the first dairy in India to get accredited with certification of ISO 2200:2005 & ISO 9001 for its operations and plants. Even the village level dairy cooperatives have ISO certification.⁹ The company has been very successful in tapping the traditional food value chain actors comprising small traders and retailers to reach final consumers. Post-farmgate, GCMF markets its products through its network of 56 state-level sales offices and network of distributors, wholesale dealers and retailers. The retailers range from small petty shops at the lowest level in small towns and villages to big retail outlets and get their supplies from wholesale dealers. The latter get their stocks from distributors who get their supplies directly from Amul's office in that state. Some wholesale dealers also have their own sales outlets. There are also Amul franchisee outlets in big cities that deal exclusively in Amul products. These outlets also get their supplies from the wholesale dealers.¹⁰

4. Qualitative Assessment of Market and Product Use

In this section, business strategies are discussed under product, price, promotion and place in Odisha; and the positioning of Amulspray as children's food.

4.1. Product

Amulspray is a fortified skimmed milk powder manufactured for consumption by children. Broadly there are two kinds of packages — tin containers and plastic pouches/sachets. The larger quantity packs of 1000 g and 500 g are available in both tin containers and plastic pouches; whereas the smaller quantities are sold in plastic pouches/sachets (see **Table 2**). The affordability of the smaller sachets increases accessibility of Amulspray to the population at the bottom of the pyramid. Though promotion/advertisement of the product is prohibited by Indian law, it has developed brand value and goodwill through its sustained presence, as revealed by the following sample response from one of the retailers interviewed:

"...since the beginning (about 40 years), I have been selling Amulspray... you can prepare tea, curd, khiri (a dessert)... anything you want. If Amulspray is unavailable, no wedding ceremony is possible."
 – Retailer in Pipli, December 2015

Consumer perceptions for Amulspray also seem to have changed in its long lifecycle.

"No, children are not fed with this (Amulspray). For children, there are other brands. Earlier, Amulspray was the only one..." – Retailer in Pipli, December 2015

⁹ <http://www.amuldairy.com/index.php/cd-programmes/quality-movement>

¹⁰ <http://amul.com/m/amul-franchise-business-opportunity>

The field survey for qualitative assessment of consumption revealed that there are three major uses of Amulspray that are driving sales of the product in Odisha.

i) *As substitute for milk in khiri (a dessert made from milk and rice):* Amulspray is used in place of milk in *khiri*, largely made during festivals and weddings. No wedding in Odisha is complete without *khiri*, and therefore without Amulspray. There is huge demand for the 1000 g packs during the wedding season.

ii) *As substitute for milk in tea:* Tea with milk is generally consumed daily. With deficit in production and availability of liquid milk, Amulspray has become a popular milk substitute in the state. Consumers, particularly women of the household, find it convenient to buy a product that can be stored for a longer duration. This helps avoid the everyday transaction of milk purchase and also the danger of adulteration of milk with water (or chemicals).¹¹ Further, ready availability of the milk powder within the household makes it convenient to meet sudden urgent requirements. There are two kinds of buyers with this use, ones that buy the 500 or 1000 g pack of Amulspray and others who buy the ₹ 10/- sachets on a regular basis. Students and daily wage earners buy the small packs as it is more affordable for them. Interestingly however, a few respondents belonging to the Marwari community (a group who migrated to Odisha many years ago from north-west India) said they preferred to buy fresh liquid milk rather than Amulspray.

iii) *As milk substitute with cereal at breakfast:* Odisha is a major rice producing and consuming state; different products from rice are part of the daily diet. *Chuda* (rice flakes) mixed with Amulspray and water is a popular breakfast dish in the state. Packaged *Chuda* powders (made of fried rice flakes, dry fruits and sugar) are available in the market; they are consumed as food by both children and adults. Consumers buy Amulspray to complement it and the breakfast is regarded as an energy-dense food.

While these — dessert, tea and with breakfast cereal — are the three popular uses of Amulspray (in that order), there are also a few other preparations like yogurt, ice creams and other desserts that use the product.

4.2. Price

The cooperative is a network that works for dairy farmers. Profitability for dairy farmers from revenue generated from the range of Amul products is at the core of pricing and business strategies. It was found that sometimes Amulspray is provided to the distributor at a discounted price to push sales, and subsequently, the discount is passed on to the wholesalers and retailers.

Price is also influenced by international markets as price differentials provide an opportunity to export or import milk (skimmed milk powder) by competitors, thereby determining the prices in Indian markets. These price differences are not reflected in the labelled maximum retail price (MRP) but consumers are able to get a discounted price.

A number of retailers interviewed said that the product sold at a very slight mark up in 2015; though most grocery stores and petty shops had stocks for sale. Amulspray is perceived as an essential commodity and an indicator of general prices.

¹¹ <http://timesofindia.indiatimes.com/india/70-of-milk-in-Delhi-country-is-adulterated/articleshow/11429910.cms> accessed 20 January 2017

“Buyers usually enquire about prices of a few products and then choose the shop to buy their monthly groceries; Amulspray is one of those products along with essentials like sugar and oil” —Shopkeeper at Unit 4 Bazaar, Bhubaneswar, December 2015

So, retailers sell Amulspray at low or no margins in order to retain regular customers. This is the case with large packs, like the 1000 g pack even being sold at ₹ 20/- less than the MRP of ₹ 340/-; the smaller packs of ₹ 10/- and ₹ 5/- are not sold at a discount. Retailers also provide credit to customers who do not enjoy these discounts.

4.3. Promotion

Promotion of Amulspray, as stated earlier, is prohibited by the Government of India, in accordance with the International Code of Marketing of Breastmilk Substitutes (WHO 1981). Given its sustained presence in the market since the 1960s, Amulspray seems to bank more upon the brand image created. The changed consumer perspective from food for children to milk substitute can be attributed to the absence of advertisements and entrance of other baby food brands like Dexolac, Lactogen and Cerelac.

4.4. Place/Distribution

Amul has a network of regional and state offices. The sales representatives from the company's office in the capital city (Bhubaneswar) visit the distributors with Amulspray and other Amul products like butter, ghee, buttermilk, *lassi* and chocolates on a regular basis, which is normally thrice a week. The distributors supply the products to wholesalers and retailers; some of them also sell directly to the final consumer. Over the years, the company has established a stable link with traditional traders and retailers, in the process reaching out to even far-flung rural areas.

Although the use of Amulspray as infant food has decreased, overall sales of the product have always grown, driven by other uses. A distributor in Odisha explaining the problem in reaching the children's food segment said:

“People at Amul (state and head office) think if we give the product to the distributor, their job is done. That is not the case”

The distributors have pressure to push sales every year to meet new targets, and they have been doing this successfully for the last many years by reaching more wholesalers and retailers. In the drive to achieve higher sales, the wholesalers and retailers sell Amulspray for use both as child food and non-child food at thin margins; other competitive child-food products are sold at higher margins.

The retailers receive their supplies from the wholesaler at periodic intervals. The presence of Amulspray for many decades has facilitated penetration into rural areas; the introduction of affordable packs is an important business strategy to reach poor households. The distribution network is well entrenched to supply the required quantities.

4.5. Is Amulspray used as food for children?

Both retailers and consumers had mixed responses to the question regarding use of Amulspray as food for children. Although consumers are well aware that Amulspray is an infant and child

complementary feeding product, it is not popularly consumed by or fed to infants. The awareness of Amulspray being a food for infants is due to the fact that even till about 10-15 years ago Amulspray was the most popular brand in this market segment.

“...in case of childbirth by Caesarean section, if the mother was unable to produce milk, Amulspray was generally recommended by the doctors, but only for the initial days” —Women respondent in Pipli, December 2015

During discussion with a group of mothers from the middle income group in an urban setting, most of them said that though Amulspray was regarded as infant food, it is hardly used for that purpose now. There are other brands, many of them recommended by doctors and hence are more popular even though they expensive. There is also a consumer rationale for buying more expensive products rather than Amulspray for children, as the perception is that higher price means better nutrient content in the food, notwithstanding that the nutrient content of Amulspray and any another brand may be quite similar if not exactly the same. In short, the covert marketing strategies of other brands seem to a very large extent have reduced the use of Amulspray as food given to small children.

Respondents mentioned that till about a decade ago, Amulspray was the most popular infant food across different economic classes. While it is still used as a dairy whitener, the demand for Amulspray as food for small children seems to be substantially reduced. The mixed reaction of respondents (retailers, wholesalers, consumers, distributors) to the question of Amulspray being used as food for small children can be attributed to various influencing factors, like perception of the sellers and their use of the product in their own households from the supplier side, and location of store and economic status of the buyers, from the demand side. While it is a fact that use of Amulspray as infant food has come down substantially, it is still considered a nutrient-dense food for children by a small proportion of households, especially in rural areas as revealed by feedback from some of the respondents, illustrated below:

“30 per cent of population (guesstimate) would buy it for children.”— Retailer close to villages of Uttara, December 2015

The store owners closer to village settings said that about 10-30 per cent of households used Amulspray for feeding children.

Amulspray is an affordable product that is available throughout the year, with possible supply fluctuations due to greater alternative use in certain months/years. While other brands have also penetrated villages, Amulspray is still used by a few households, especially in the lower income group.

‘...there are people who add both Amulspray and other packaged child food together to feed the child’— Retailer catering to villages near Uttara, December 2015

However, it did not seem to be so in the city:

“No one is using it for children. People buy small packets for tea and bigger ones for making khiri.” — Retailer in Unit 4 Bazaar, Bhubaneswar, December 2015; suggesting a possible negative relation

between distance of store from villages and the response from sellers and buyers.

5. Competition in the Segment and Dynamics of the Dairy Industry

Per se, there is no price competition for Amulspray in the baby food segment as it is the lowest priced product within it. For instance, 400 g of Nan, Nestlé's infant food formulation, costs ₹ 460/- (£5.4) while 1000 g of Amulspray costs just ₹ 340/- (£4)! But it was found that, except for the lowest economic class for whom other brands are not affordable, Amulspray has been losing its market share. So there is a clear segmentation of the population that uses Amulspray as food for children. This aspect was reiterated by many respondents.

A decade earlier, Amulspray was not sold in affordable packs accessible to lower income households. This may have been because it would have affected the market for another Amul product — Amulya — that is basically a dairy whitener. Other producers selling small packs at economical prices were capturing the market. In villages, consumers would buy small quantities of Amulspray in loose form. With the introduction of the 27 g pack of Amulspray priced at ₹ 10/-, there was a little setback for Amulya; and Amulspray, with its established brand image, was able to out-compete other local manufacturers reportedly based in Cuttack and Kolkata. This pack is used for preparation of tea, as well as infant food, by the economically weaker sections of the community. This came out clearly from the response of consumers and other value chain actors. The smaller packs also helped address issues of food safety in selling loose quantities of the product.

In recent years, Amulspray is facing competition from many local manufacturers producing liquid milk from skimmed milk powder. The popularity of Amulspray in other uses may also be affected by the influx of liquid milk made from powder in the market. The margins have been falling for value chain actors of Amulspray and in 2015, many of them made losses. While Amulspray is a habitual product for the consumer, it is becoming less attractive for the value chain actors. In effect, Amulspray is facing tough competition across all segments of consumers. We discuss these challenges in the next section.

6. Challenges in Reaching the Target Population

The focus of this study is to assess whether Amulspray, a fortified milk product produced by a business enterprise, is able to overcome common challenges such as distribution and affordability in reaching economically poor households, and their children in particular.

6.1. Change in product perception

The qualitative feedback from different actors along the value chain revealed that the segment of economically poor households is not the driver of sales of Amulspray. The product is reaching the target segment due to other drivers of sale. That is, although the introduction of affordable packs has had positive benefits in making the product accessible to children in the economically lower section, it is not possible to conclude that this segment of the population alone is responsible for the sale. As discussed, use of the product for purposes other than as food for children is substantial

across rural and urban centres. Thus, the target section (children of poor households) is not necessarily the target for the commercial and business objectives of the cooperative company.

Hence a scenario where Amulspray as a food for children can survive with this targeted segment of population as its market is not a feasible option. This was however not the case about a decade ago when most of the economic segments were buying Amulspray for consumption by the children in the household. Competition has increased, taking Amulspray out of that specific market.

6.2. Challenges in rebranding

Rebranding of Amulspray as a fortified milk product to be given as complementary food to older children seems to be impossible, given the change in perception and use of the product over the last decade. It was discovered during the course of the survey that in 2015, Amul had piloted a new product in the segment called *Instant 1 and 2*. The product was priced low, but as discussed earlier, the competition in the baby food segment is less influenced by prices; and the product did not take off.

Further, Amulspray does not have dedicated product promotion/marketing teams that many other child food product manufacturers in the segment seem to be having. Amul products are however priced lower than most other similar products in the market. Amul as a cooperative business seems to be banking more on its brand image for market outreach. This implies that consumers choose branding over price when selecting nutrient-rich products for infants.

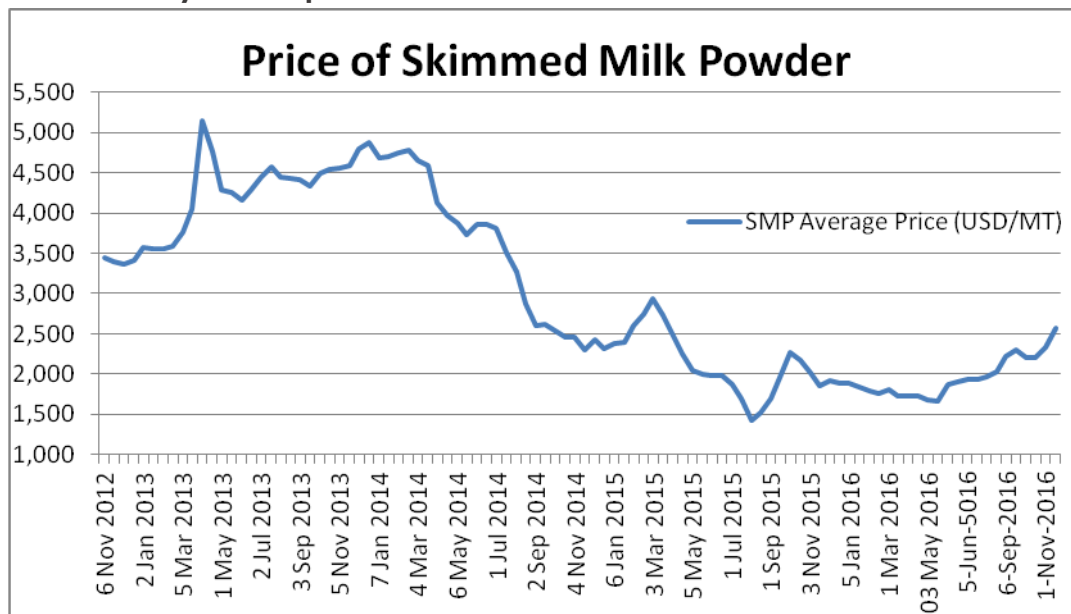
6.3. Market saturation

It seems that at the given price, the market for Amulspray has saturated in Odisha, as revealed by the declining sales margins. One way out for sustenance of the supply chain seems reduction in quantities produced, with price increments to increase the margins for the value chain actors. Since Amul has a huge range of products, the milk procured can be diverted to manufacture of other products. The value chain actors are confident that this will not increase the presence of other brands in the market, as Amulspray is a habitually preferred product in Odisha. But for the targets of the study, i.e., the children from households in the lowest economic section, this strategy may reduce the availability and affordability of food. This is a challenge because it is not possible to say that the targeted segment of the population can provide scale to drive the sales of Amulspray.

6.4. Falling global milk prices

The background to the above challenge is the global trend of falling milk prices. **Figure 2** shows the volatility in price of skimmed milk powder (SMP) from 2012 to 2016. The fall in price has led to the entry of many small manufacturers of liquid milk from SMP in the domestic market, taming the demand for Amulspray as dairy whitener. Being a cooperative which primarily works for its member farmers, the milk procurement price cannot be reduced by Amul, unlike many other commercial firms. This situation might get corrected if price of SMP rises again. But if not, this poses a big challenge as, with increase in price and reduction in quantity of Amulspray produced, the economically poor households and their children would be among the first segments to face the hit.

Figure 2: Volatility in milk prices



Source: Global Dairy Trade

7. Assessment against the Conceptual Framework

Amul spray, as a fortified nutrient-dense, packaged agri-food product, fulfils the first two outcomes in the conceptual framework of Henson and Humphrey (2015), viz., 'Food must be safe to eat on a sustained basis', and 'Food must be nutrient-dense at the point of consumption'. The adequacy of consumption, the third outcome, is however a point of contention, given the multiple uses of the product rather than just as nutrient-dense food for children.

Considering the consumer requirements about the product listed by Henson and Humphrey (ibid.) for sustainable nutritional intake, it is seen that all the five prerequisites are satisfied: Nutritional Awareness (about the food); Signalling (the food is 'good' and has credence factor); Acceptability (majority of the responses were 'tastes good', and 'easy to prepare'); Availability (it is available in most locations from small shops to big malls) and Affordability (the small packs are affordable to the poor sections). It is a trusted product backed by the brand image of Amul. But the preference for Amul spray as nutrient-dense food for children is however limited to very few sections of the population; perhaps other brands undertake more signalling (requirement 2) for their product than Amul spray. Rebranding and segregation of market as food for older children and dairy whitener or liquid milk substitute may increase the reach to more segments. The segregated product could then be promoted / advertised and that might have positive influence on older children and adults for consumption with breakfast cereals. It is not possible to comment on these aspects without more information through quantitative assessment of consumer behaviour.

Likewise, from the perspective of other actors along the supply chain, the value chain satisfies almost all the requirements. There is a fixed pattern of distribution that helps in value chain coordination; the players involved are able to capture value for their role in the chain though there is a substantive depletion in margins; but this may be seen as a way to manage the risk and uncertainty caused by market/price fluctuations in the short-term. Essentially, while the Amul product basket as a whole may be sustainable, sufficient incentive seems to be lacking for Amul spray per se. This is evidenced in

sale of the product at zero margins, or even less, by retailers. While this can work in the short-term, long-term sustainability of the product chain and availability of the product itself may become issues.

Figure 3, following Henson and Humphrey (ibid.), illustrates possibilities for a business model to fall under four categories. Quadrant D is the desired category of the outcome of sustained consumption of nutritious food. Given the business is sustainable, even while the product is not in demand as ‘food for children’, it can be said that the Amulspray business model fits into the C quadrant.

Figure 3: Requirements for sustained nutritional outcomes from value chain-based interventions

		Consumer Choice	
		No	Yes
Sustainable Business Model	No	A	B
	Yes	C	D

Source: Henson and Humphrey 2015

The discussion in the earlier sections showed how the business was able to establish itself as a food for children in the initial decades; however, after the complete ban on promotion and advertisement of baby foods, as well as opening of the market and entry of multiple players, the product’s use seems to have become more diversified rather than targeted at a single segment. While the reduction in market penetration is a consequence of the new entrants in the sector, the change in consumer perception of Amulspray as a food for children to milk substitute may be attributed to policy restrictions on marketing of baby food.

The value chain of Amulspray is a product of the larger state support for the milk revolution in the country; the product itself has market concentration in areas that are deficit in milk production. In spite of being a fortified food for infants at a price more affordable than other brands, there are restrictions, however, on getting this information across to consumers; the blanket restriction on promotion of infant foods, stemming from a broader concern, impacts on marketing of the product. Gillespie et al (2013) make a case for the state’s role in both protecting breastfeeding and facilitating informed choices by caregivers from available fortified complementary foods.

Some kind of asymmetry of information can be assumed for Amulspray as the reason for being in the C quadrant rather than in the desirable D quadrant. With better availability of necessary information for the consumer to make an informed choice, it may be possible for the product to move to quadrant D. This is an area where the private or cooperative business sector, which has the potential for a major role in marketing of fortified agri-food products, can benefit from guidance in the marketing of infant food as complementary and supplementary food for older children. For ‘safe and sustained consumption of nutrient-dense food’, the state needs to provide more guidance at different levels of the value chain.

8. Summary and Conclusion

Amulspray was launched in the early 1960s as an infant milk substitute; but it is now popularly used as a dairy whitener. The product gained substantial popularity in the milk-deficit eastern region of India and continues to have considerable market share in the area.

The uses of Amulspray have evolved and at present the main use of the product is not as baby food although it is the lowest-priced baby food available in the market. Even though all the value chain actors and consumers are aware of the fact that Amulspray is a baby food, given its popular use for this purpose in the past, the two most prominent uses of Amulspray today are for preparation of dessert during weddings and festivals, and with tea. The product however has potential to reach the poorest segments of the population as nutrient-dense food for children. Use of Amulspray may have positive nutritional impact if consumed in adequate quantity and on a sustained basis, as the product with milk as the base is both naturally nutrient-dense and fortified with micronutrients. Evidence was found of Amulspray being bought to feed young children by households in lower income groups. This segment of population also uses Amulspray as dairy whitener and the affordable pack of 27 g priced at ₹ 10/- especially targets this segment. Although poor households buy the product as food for their children, this segment is not the sales driver of Amulspray. Hence the accessibility of Amulspray as 'food for children' to this section is linked with other segments of consumers driving its sales.

It is evident that a targeted strategy towards nutrition is an important aspect for enabling a business to sustain its reach in poor households (ATNI 2016a). Government policies also have an important role to facilitate environments for business to have nutrition strategies for their mainstream product (ATNI 2016b). It is also to be noted that Amul is not taking up any nutritional awareness strategies to rebrand Amulspray as baby food, targeting new generation mothers with older children. Such awareness generation could be a means of shifting the product to the desired quadrant of both sustainable business and consumer choice in **Figure 3**. Therefore, Amulspray is today largely a popular substitute for milk rather than a food for children in Odisha; this is possibly the case in other eastern states of India also.

As an agri-food business cooperative, GCMMF provides a larger market reach to the farmer/producer through professional management of business on one hand; on the other hand, it serves the needs of consumers having dearth of milk supply by providing a range of milk products (including Amulspray). The cooperative model brings efficiency by cutting down the intermediaries in the value chain for procurement and addressing the need of enhancing the income of farmer-producers through higher milk production and better price. The government support and necessary policy initiatives that steered Operation Flood in the country have enhanced the production and productivity of milk and its availability to consumers across all income classes in India. The convenient packaging and affordable pricing by the company has made it accessible to poorer households and safe at the point of consumption.

The case study highlights opportunities that commercial value chains have for enhancing consumption of nutrient-dense food by economically poor households. The study underscores the importance of commercial value chains in fulfilling consumer demand in production-deficient regions in emerging economies, while enhancing market access to farmers. Examining the food supply chains

in India, Reardon and Minten (2011) make the point that the private sector, comprising both modern and traditional value chain actors, are major players today in deciding India's food security. The modern value chain of GCMMP's market network linking with traditional food value chain players is a major plus that increases the potential to reach low income households in both rural and urban areas. Gomez and Ricketts (2013:16), in a paper on food value chains in developing countries, observe that traditional Food Value Chains (FVC) enjoy cost and location advantages and can deliver nutritional benefits to rural residents and low income people in urban areas. They, 'posit that processed/packaged foods sold through modern-to-traditional FVCs may help alleviate (and prevent) undernourishment in rural areas'. This brings into focus opportunities to leverage commercial value chains for enhanced nutritional intake; but also comes with the challenge of regulating these value chains to facilitate informed choices by consumers. Amulspray, being a fortified food, has also an important role in creating greater awareness about consumption of fortified foods. With a more explicit steer in these directions, it may well be possible for Amulspray to make an impact on nutrition outcomes.

A recent report of the Global Panel on Agriculture and Food Systems for Nutrition (GloPan 2016) lists focusing food and agriculture policies in South Asia on securing diet quality for infants and young children to promote optimum nutrition in the first 1000 days of life, as a priority in the context of the SDGs. Regulation and standards for both fortified and non-fortified packaged food is important, given the pervasive reach of the agri-food value chain. Emerging economies need more support and guidance by way of government regulation to leverage agri-food value chains for nutritional gains and to avoid unintended consequences for consumers, by facilitating informed choices. Such policy direction may give an impetus to the manufacturers in this segment to position their products accordingly.

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