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VALUE CHAINS FOR NUTRITION IN SOUTH ASIA: WHO DELIVERS, HOW, AND TO WHOM?

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Private Business-Driven Value Chains and Nutrition: Insights from India^{*†}

Rohit Parasar and Bhavani RV

Abstract Despite rapid economic growth, undernutrition rates in South Asia remain among the highest in the world. It is also seen that both rural and urban populations in developing countries are increasingly dependent on markets for food. This makes examining the potential of different agri-food models to deliver nutritious foods relevant. This article examines the value chains of two fortified foods manufactured by private sector business in India using the conceptual framework in Maestre, Poole and Henson (2017), to understand their potential to reach economically poor households. We find that both value chains have potential but are unsuccessful in reaching nutritionally vulnerable populations. In both cases, a favourable institutional environment can enable them to have a pro-nutrition and pro-poor focus. A proactive state role and regulation are called for to provide the necessary institutional environment to ensure that private business-led value chains focus on enhanced intake of nutritious food by low-income households.

Keywords: value chains, pro-nutrition, private sector, markets, fortification, institutional environment, regulation.

1 Introduction

South Asia is one of the hotspots of undernutrition, housing about 35 per cent of the world's undernourished population (FAO, IFAD and WFP 2015). The region also suffers from the triple burden of malnutrition, i.e. high prevalence of undernutrition and micronutrient deficiency, and increasing prevalence of obesity (Gómez *et al.* 2013; Popkin, Adair and Ng 2012). The trend is also observable in India, with 36 per cent of children under five years of age underweight, 58 per cent anaemic, 23 per cent of women (15–49 years) underweight, 21 per cent obese, and 53 per cent anaemic (GoI 2017).

All key actors have a role to play to address this problem: the state, private business, and civil society. Further, large populations in both rural and urban areas of developing countries are seen to be increasingly



Table 1 Packaged processed food in India

	% of population spending on packaged processed food		Share of packaged processed food in total food expenditure (%)	
	Urban	Rural	Urban	Rural
All	86.3	80.3	5.4	4.0
Lowest MPCE class	76.4	67.0	3.0	2.8
Highest MPCE class	90.9	81.4	7.2	5.1

Source NSSO (2014).

dependent on markets for food (Reardon 2015; Maestre *et al.* 2017). In India, about 86 per cent of urban and 80 per cent of rural consumers buy packaged processed food. A large majority of the population, including those in the lowest monthly per capita consumer expenditure (MPCE) class, access packaged processed food. Access to packaged processed foods increases with rising incomes and urbanisation. Expenditure on processed foods by an average urban consumer was double that of a rural consumer (NSSO 2014) (see Table 1).

Assessing the effectiveness of post-farmgate agri-food value chains and the role of private sector business in making nutritious food available particularly to poor and nutritionally vulnerable households becomes important in this context. Diets in lower income groups are generally dominated by cereals and lack dietary diversity (Nithya and Bhavani 2016). Location of population is one of the factors to take into account. Urban areas tend to have better markets and infrastructure than rural areas, sometimes facilitating better access to nutritious food. Regionally isolated communities such as indigenous tribal groups may face the problem of access to diverse food round the year, in addition to affordability due to poverty; for instance, in India, about 45 per cent of tribal children <5 years of age are underweight against the national average of 35 per cent for all children (GoI 2017).

The private sector, both traditional (e.g. local retail shops) and modern (e.g. supermarkets) has been gaining importance in deciding India's food security (Reardon and Minten 2011). For the food industry, rural and low-income populations represent a big market: '*companies are looking to the base of the pyramid – i.e. to the poorest socioeconomic groups – to expand market share*' Gillespie *et al.* (2013: 558). Traditional food value chains facilitate access to foods rich in micronutrients for urban low-income people and for the majority of rural people (Gómez and Ricketts 2013). However, Gelli *et al.* (2015) argue that low levels of nutrition awareness, poor signalling mechanisms, and restricted/expensive distribution outlets, limit the ability of the private sector to respond

with nutrient-dense products for mass consumption. Also, easy access to packaged foods high in sugar content is triggering an unhealthy nutrition transition, leading to the problem of obesity (Relton, Strong and Holdsworth 2012; Rodrigues *et al.* 2017). For companies to be able to produce and distribute diverse and healthy products, embedding nutrition in their core business strategy emerges as a key requirement (ATNI 2016a).

Fortification of food through biofortification and industrial fortification is one of the pathways to address malnutrition caused by micronutrient deficiency (Bouis and Saltzman 2017; Gelli *et al.* 2015; Maestre *et al.* 2017); it is a means for the food industry to have a nutrition focus. Fortified food products can be segregated broadly into foods that are widely consumed by the general population (*mass fortification*), foods designed for specific population subgroups (*targeted fortification*), and voluntary fortification by manufacturers of food products (*market-driven fortification*) (Lindsay *et al.* 2006).

This article examines agri-food value chains of two fortified food products in India, with the objective of understanding their potential to reach economically poor households (Parasar and Bhavani RV forthcoming 2018a, 2018b). These are, iron-fortified Tiger biscuits manufactured by Britannia Industries Ltd (BIL) and Amulspray, a dairy-based product manufactured by Gujarat Cooperative Milk Marketing Federation Ltd (GCMMF). The potential and limits for private sector business to have a nutrition focus and reach poor households are examined using the framework developed by Maestre *et al.* (2017). The framework is purposefully designed to assess individual value chains and does not take into account issues of dietary diversity. It is a good starting point to assess products that are nutrient-dense and have no adverse impact on health. The aim of this article is to assess the value chain strategies followed by the two companies and understand what is required for private business to have a nutrition focus.

Section 2 describes the methodology, followed by separate sections on the business organisation and value chain of the two products and a discussion around each in terms of consumer and producer requirements. This is followed by a discussion combining aspects of the two value chains. The concluding section summarises the findings and makes recommendations targeted at practitioners and policymakers.

2 Methods

A desk review and interviews were the approaches followed for the collection of information on the two value chains. In the case of Amulspray, qualitative and quantitative assessment surveys were also undertaken.

The study commenced with a desk review to collect information from secondary sources of information, viz. published reports and the official websites of the two companies manufacturing the products. This was

followed by interviews with key informants. For Tiger biscuits, we had a Skype interview with Vinita Bali, former CEO of BIL and a phone interview with a company official. Unfortunately, in spite of repeated attempts, it was not possible to meet any of the officials in person. Published papers based on efficacy trials of the iron-fortified biscuits were also reviewed.

In GCMME, we interviewed the managing director and deputy general manager (marketing) at their corporate head office in Anand, Gujarat. After analysing secondary data and discussing with GCMME's executives, we identified eastern India as a potential region for fieldwork since the region was indicated to be deficient in milk production, making it an important market for Amulspray. The state of Odisha in east India was purposefully selected for primary-level qualitative assessment and subsequently quantitative survey, to assess the reach of Amulspray to poor households, and to understand the enablers and constraints from a household perspective. The first exercise was undertaken in Bhubaneswar (the state capital), the neighbouring city of Cuttack, and surrounding rural and peri-urban areas; actors along the value chain (distributors (1), wholesalers (2), retailers (10) and consumers (17)) were interviewed. This was followed by a quantitative survey of 400 households across the three districts. The sampling details are discussed in Section 4.3.

The information collected was analysed using the framework discussed in Maestre *et al.* (2017) on how the two value chains reach the three desired outcomes (food safety, food being nutrient-dense at point of consumption, and food being consumed in adequate amounts on a sustained basis); and the different requirements from consumer and supplier perspectives.

3 Tiger biscuits

3.1 BIL and the biscuit industry

BIL is a reputable company in the Indian food industry. Incorporated in the late nineteenth century, the company went public in 1978 and today manufactures a wide range of products including biscuits, breads, cakes, and dairy-related products. These are targeted at all consumer segments – premium, mid-range, and mass. BIL had a turnover of US\$1.3bn in 2015–16.¹ According to media reports,² it served 1.4 million outlets directly and 4.5 million outlets through wholesale distribution. Around 55 per cent of its products are fortified (DFID 2011) and all products are trans-fat-free.

Biscuits are of different types and are manufactured by a range of producers, from large companies to small bakeries in the informal sector. BIL and Parle Products Pvt. Ltd, both local Indian companies, are among the two large players in the biscuit industry, followed by companies such as ITC Foods, Priya, Anmol, and Horlicks.³ Biscuits are a popular packaged food at the bottom of the pyramid (BoP); about 35 per cent of the biscuits produced were reported to be consumed by income groups earning less than US\$25 a month (Jarvis and

Magarinos 2008). Tiger biscuits are categorised as *glucose biscuits*; they are affordably packaged and priced and targeted at the BoP, while other product categories such as cookies and *cream biscuits* are targeted at middle-income or premium segments of the market. Furthermore, biscuits can be fortified economically, making them a nutritious product with which to target poor households. As mentioned previously, iron-fortified Tiger biscuits are the product of BIL being studied. Although a glucose biscuit, the choice was determined by it being a micronutrient-enriched zero trans-fat product that can address micronutrient deficiency.

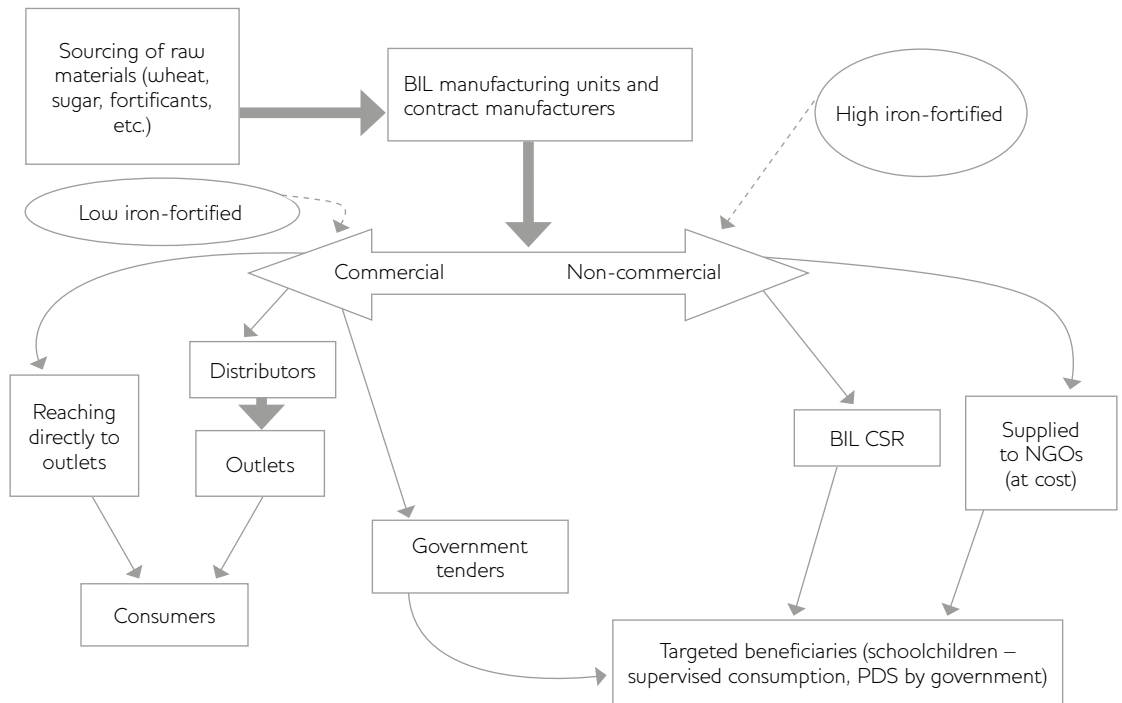
3.2 Iron-fortified Tiger biscuits

In the early 2000s, BIL began manufacturing iron-fortified biscuits for the UN World Food Programme under a corporate social responsibility (CSR) initiative. The fortification idea was taken forward to the commercial line of production by CEO Vinita Bali, who was at the helm from 2009–14. BIL came up with tag lines such as ‘*Swasth Khao, Tan-Mann Jagao*’, meaning: ‘Eat Healthy, Awaken your Body and Mind’ (Parasar and Bhavani RV forthcoming, 2018a).

The company’s decision to add micronutrients to their products came from the recognition that for poor households ‘cereal-based biscuits were a cheap source of calories that could also be nutritionally beneficial’ (Jonathan 2014). In 2007, the company developed two variants of Tiger biscuits – high iron-fortified (5mg of elemental iron per biscuit) and low iron-fortified (0.3mg of elemental iron per biscuit). The high iron-fortified biscuit, a product developed together with the Global Alliance for Improved Nutrition (GAIN), was distributed with midday meals (MDMs) in schools in Hyderabad City. The programme operated as a pilot public–private–non-governmental organisation (NGO) partnership model, with the government of Andhra Pradesh State, BIL, and Naandi Foundation, targeting children for supervised consumption of the fortified biscuits (Bhagwat *et al.* 2014). There were also pilots led by other NGOs. The low iron-fortified biscuits were sold directly in the market through regular commercial channels (*market-driven fortification*). The additional cost of fortification was reportedly minimal at INR0.06 per kg (Jarvis and Magarinos 2008). This was absorbed by the company with no increment in market price of the biscuit.

In 2014–15, following review and reformulation of its products by the company as a part of regular company practice, BIL stopped producing the high iron-fortified variant. The company website now shows three different kinds of Tiger biscuits – Glucose, Butter Krunch (two flavours), and Kreemz (two flavours). Tiger Glucose, it says, is ‘fortified with 25 per cent of daily growth nutrients like iron, calcium and vitamins’; no nutritional information is provided for the other two variants of Tiger biscuit.⁴ The official interviewed had indicated that with changes in focus and marketing strategies, the company may not necessarily promote them as micronutrient-rich/health biscuits. As a practice, all companies in a highly competitive sector such as food products would reformulate, re-strategise, and promote products on a regular basis to

Figure 1 Illustration of BIL's iron-fortified Tiger biscuits distribution chain



Source Authors' own, based on qualitative assessment.

retain their consumer segment, attract new segments, and maintain visibility. In her interview, Bali had also indicated this. The focus of such an exercise would be decided by market trends and the management's priorities. It seems the company is focusing more now on 'disruptive innovation' and higher penetration in the rural market segment.⁵

3.3 Value chain

BIL has its own manufacturing facility and also sources an equal share from contract manufacturers. It has two distribution channels, one reaching outlets directly and the other through a distributor network. BIL has also participated in government tenders for distribution of biscuits under state-mandated food distribution programmes such as the Public Distribution System (PDS). The low iron-fortified biscuit was sold through this channel; the high iron-fortified biscuits manufactured for supervised consumption by children in government schools was supplied through NGOs at cost of production for distribution under a public-private-NGO partnership model – see Figure 1.

Efficacy trials confirmed the positive effects of consumption of both variants of Tiger biscuits: an efficacy trial on the consumption of the high iron-fortified variant reported increments in blood haemoglobin levels (Maharaj, Passi and Aeri 2014). Another study on the efficacy of consumption of low and high iron-fortified biscuits in rural areas of

Karnataka State concluded that both variants significantly increased body weight and haemoglobin levels in schoolgoing children (Bal *et al.* 2014). At the time of this study, the supervised consumption value chain under the public–private partnership (PPP) model was on hold; the company official contacted could not say whether it would be resumed.

3.4 Discussion

Tiger brand biscuits is a potential vehicle for increasing intake of micronutrients. Efficacy trials substantiated the positive impact of intake of the iron-fortified product on reduced levels of anaemia. The biscuits are manufactured for the mass consumer segment and sold at an affordable price with limited margins in large volumes (Hills *et al.* 2012). A study of the distribution of high iron-fortified biscuits as an ‘add on’ to the hot cooked food provided as MDMs highlighted the importance of *targeted fortification* of food to enhance micronutrient intake by schoolgoing children. According to the same study, other options such as supplementation of micronutrients through capsules face challenges of compliance and coverage (Bhagwat *et al.* 2014); by joining up with a state-led food distribution programme, they also have the potential to target nutritional intake to vulnerable households (as shown in Bhavani RV and Parasar, this *IDS Bulletin*).

Following the conceptual framework outlined in Maestre *et al.* (2017), when looking at the three outcomes for the nutrient-dense product to be successful, one finds that as a standardised packaged food product, it fulfils the first two outcomes of being safe and nutrient-dense at the point of consumption. Adequacy of consumption is assured under the *targeted fortification* approach but not under *market-driven fortification*. Further, examining the five consumer requirements of *availability*, *affordability*, *awareness*, *signalling*, and *acceptability*, one finds that the first two are satisfied with the product being available in affordable packets at a multitude of outlets, and reaching the mass consumer segment. Nutrition awareness and signalling are achieved under the *targeted fortification* approach but not guaranteed under *market-driven fortification*.

The *targeted fortification* ensures the quantity of intake and protects the consumer/beneficiaries from overdose. However, unsupervised consumption under a market-driven value chain cannot ensure the adequacy of consumption and may also risk overdose by the consumer. It is important to fix a lower level of fortification of food in such arrangements, as seen in the case of Tiger biscuits. *Acceptability* in terms of taste is a determining factor; the formulation of the product was done in consultation with the National Institute of Nutrition, Hyderabad, and several rounds of trials/testing were undertaken before it was launched.

Maestre *et al.* (2017) also outline five supply-side requirements, viz. ‘capturing value’, ‘distribution of incentives along the value chain’, ‘coordination and governance’, ‘managing costs, risk and uncertainty’, and ‘appropriate institutional environment’. BIL’s officials were not accessible in order to discuss current business strategy; therefore, it is

not possible to comment on the company's supply-side requirements. The limited information base of BIL is a constraint that could not be overcome. Nevertheless, the production of fortified biscuits seemed sustainable, as indicated by Bali during the Skype interview. An article reported that in fortifying its biscuits, BIL saw 'the fulfilment of two of its goals – tackling nutrition issues in the country and building a sustainable business model'.⁶

For the low iron-fortified biscuit, the cost to the company was minimal, as stated previously, indicating operational feasibility of the initiative. This was backed by strong commitment from the top management. Bali mentioned during the Skype interview that addressing malnutrition should not be CSR as mandated by the Companies Act but the '*corporate responsibility*' of the food industry.

Recent reports as mentioned previously indicate a change in BIL's positioning of the Tiger brand biscuits and that it will be the vehicle for BIL's thrust on rural markets (Law 2016). This may be a consequence of shareholders/promoters' perception that a loss of market share is due to the focus on nutrition and related marketing strategies (Shashidhar 2015). A supportive institutional environment supporting fortification to address malnutrition may perhaps have helped continue the thrust.

4 Amulspray

4.1 The business organisation

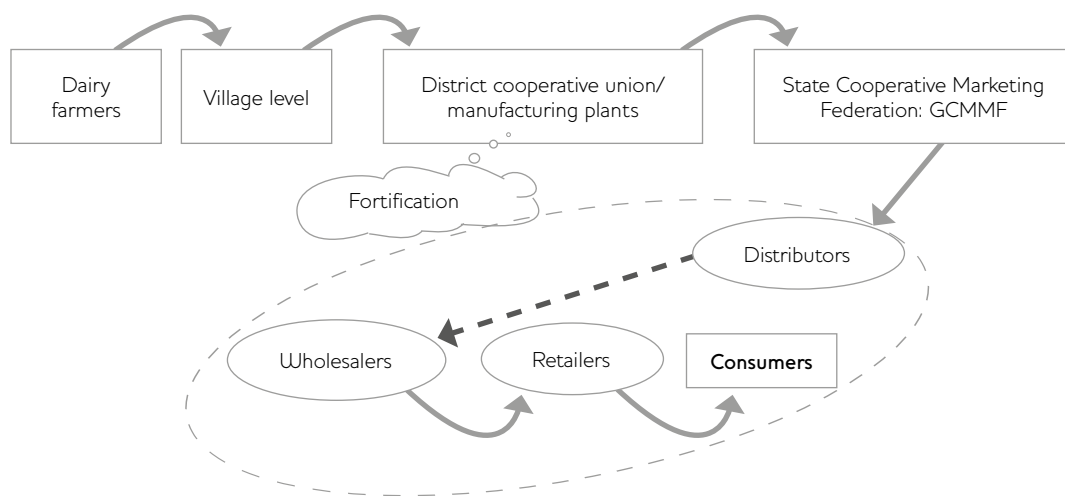
Amul is an established brand in the Indian dairy industry, selling a range of dairy products manufactured and marketed by GCMMF, a federation of dairy cooperatives, with 6.8 million producer members and a turnover of US\$4.1bn.⁷ GCMMF has state-of-the-art manufacturing facilities and is one of the first dairy companies in India to get ISO 2200:2005 and ISO 9001 certification. Besides liquid milk, the company manufactures a range of milk products – dairy whitener, infant food, butter, cheese, ghee, and ice cream.

4.2 Amulspray

Amulspray is an 'infant milk substitute' formulated using World Health Organization (WHO) guidelines. In the 1950s, GCMMF forayed into a market with a prominent presence of multinational brands such as Glaxo Baby Food. Amulspray is enriched with essential micronutrients – vitamins A, D, K, B group, C; and the minerals calcium, magnesium, phosphorus, iron, copper, manganese, and zinc, to supplement the recommended dietary intakes for children. Being a child and infant food, it does not contain any other edible component such as cereals. In the initial years, it was promoted as an ideal substitute for mothers' milk; this was criticised by NGOs and child health activists.

The company subsequently changed strategy and highlighted the importance of breastfeeding in its campaigns. In 1992, the Government of India banned all kinds of promotion and advertisements for infant foods. The Infant Milk Substitutes, Feeding Bottle and Infant Food Regulation of Production, Supply and Distribution Act (1992) and

Figure 2 Illustration of value chain for Amulspray



Source Authors' own, based on qualitative assessment.

Amendment Act (2003) – the IMS Act – prohibits any kind of promotion for foods intended to be consumed by children below two years of age.

All packets of Amulspray now state: 'Mother's milk is best for your baby'. The product is available in seven packages of different weights, ranging from 1,000g at INR357 (£4.1) to 13.5g at INR5 (6 pence), targeting different customer segments (Parasar and Bhavani RV forthcoming, 2018b).

4.3 Value chain

Small dairy farmer producers are at the base of the value chain of the product. The milk procured is used for manufacturing a diverse range of dairy products. Figure 2 illustrates the actors in the Amulspray distribution value chain – state-level head cooperative office, distributors, wholesalers, retailers, and consumers. Depending on the area, the distributor-wholesaler-retailer may be just one actor.

The smaller sachets of Amulspray are targeted at lower income groups. Amulspray is distributed in a fixed weekly pattern along with other Amul products to the value chain actors. The company's business strategy has always focused on 'value for many and value for money',⁸ enabling it to establish a wide market reach.

WWStore owners closer to rural areas said that about 10–30 per cent of households use Amulspray for feeding children. While other brands are also present in some of these areas, 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 Utara, Bhubaneswar)⁹

Table 2 Distribution of sample households by district

District	No.	%
Khurda	120	30
Koraput	137	34.3
Mayurbhanj	143	35.7

Source Authors' own, based on the Population Census (Gol 2011).

Table 3 Distribution of sample households by location

Location	No.	%
Urban	71	17.8
Rural	242	60.5
Tribal	87	21.7

Source Authors' own, based on the Population Census (Gol 2011).

Though the formulation was produced as a complementary feed for infants, it came to be consumed more by older children and as a dairy whitener by adults, as revealed during the course of interviews with different respondents; for example:

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. (Customer in Bhubaneswar, Odisha)¹⁰

The quantitative survey of 400 households was undertaken across three districts of Odisha, to assess the reach of Amulspray and understand the dietary pattern of children between six months and five years. One district each in central, north, and south Odisha were purposefully selected to produce a sample distribution that covered rural, urban, and tribal households. The proportion of population was based on the Census (GoI 2011) – see Table 2. The samples for tribal households were selected only from the tribal population-dominated districts of Mayurbhanj and Koraput; urban households were randomly selected from slums and identified low-income pockets in the districts (Table 3).

The survey revealed that about 21 per cent of the children are fed with Amulspray (Table 4).

The quantitative survey reaffirmed the findings of the qualitative assessment regarding the major uses of Amulspray. About 61 per cent of the population surveyed use Amulspray for tea, 16 per cent use it with breakfast cereal, 34 per cent use it for making desserts during feasts, and about 33 per cent do not use it at all (Table 5).

Table 4 Percentage of children (6 months–<5 years) consuming Amulspray

	Location			Total
	Urban	Rural	Tribal	
Yes	19.7	21.9	18.4	20.8
No	80.3	78.1	81.6	79.3
Total	100	100	100	100

Source Authors' own, primary survey (2016).

Table 5 Household share in different uses of Amulspray (%)

Uses of Amulspray	Location			Total
	Urban	Rural	Tribal	
Tea	64.8	63.2	50.6	60.8
Dessert	49.3	36.8	11.5	34.3
Breakfast cereal	16.9	20.2	10.3	16.8
Milk	11.3	6.6	3.4	6.8
Other	0	0	2.3	0.5
Not used	29.6	27.7	49.4	32.8

Source Authors' own, primary survey (2016).

Given the wide acceptance of the Amul brand, Amulspray is perceived as an essential product and often acts as an indicator of price level for consumers, to determine their purchase from a particular shop. Hence, Amulspray is also often sold at lower prices with very limited margins for the retailers, in order to attract customers.

Buyers usually enquire about prices of few products like Amulspray, sugar, and oil and then choose the shop to buy their monthly groceries. (Shopkeeper at Unit 4 Bazaar, Bhubaneswar)¹¹

4.4 Discussion

As in the case of the iron-fortified Tiger biscuits, Amulspray fulfils the desired outcomes of being safe and nutrient-dense at the point of consumption. But the third outcome, adequacy of consumption, cannot be ensured; in fact, the major finding was that it is used less as a children's food. In terms of consumer-side requirements, 'availability' and 'affordability' for poor people are ensured through convenient packaging and market outreach. Amulspray is the lowest priced children's food available in the market; for example, 400g of Nestlé's 'Nan' (an infant food) costs around £5.30, whereas 1,000g of Amulspray costs only £4.10.

Table 6 Consumer perception about the price of Amulspray

Price perception	Location			Total
	Urban	Rural	Tribal	
Cheap	36.5	26.4	22.7	27.5
Cost-effective	46	47.7	39.4	45.8
Expensive	15.9	21.8	34.8	23.2
Very expensive	1.6	4.2	3	3.5
Total	100	100	100	100

Source Authors' own, primary survey (2016).

No *awareness* and *signalling* initiatives are undertaken, given the prohibition on promotion of infant foods; this may be one of the reasons for the low usage as complementary food for children.

There is wide *acceptability* of the product, even though it is not being used by consumers for the purpose indicated. The qualitative survey revealed that people were aware of Amulspray being a food for children, though the uses have changed. Being a naturally nutrient-dense product from a reputable company, it has credibility and is also available in remote locations. However, with the prohibition on promotion of infant foods and an influx of other players in the market, Amulspray has lost its product perception and market share as a children's food. It was found during the qualitative assessment that other baby food brands follow covert promotion practices (e.g. having doctors/shopkeepers recommend them).

There are challenges in rebranding Amulspray to regain the perception that it is a food for children. Amul once tried a new product, Instant 1 and 2 for older children, but it did not take off in the absence of dedicated promotion/marketing teams that other children's food manufacturers have. However, the product *per se* does not have price competition in the market; only 2.7 per cent of surveyed households found it expensive or very expensive (Table 6).

Amulspray's use in the preparation of tea and desserts seem to be the main sales driver for the product. The quantitative survey also revealed that the regular consumption of milk by children aged between six months and two years is very limited.

In terms of the business requirements, *capturing value* is constrained by the ban on the promotion of infant foods. *Distribution of incentives* is under stress with value chain actors interviewed during the qualitative assessment expressing a decline in margins (Parasar and Bhavani RV forthcoming, 2018b). Every year, GCMMF tries to increase its sales; however, since the suppliers are small milk producer members of the dairy cooperative, there cannot be a reduction in the procurement price of milk; market saturation seems to be squeezing their margins.

A decline in the international price of skimmed milk powder¹² and an influx of liquid milk made from powder into the market has increased the competition for Amulspray, in the non-children's food segment, which is its main sales driver; this could become a challenge for sustainability if the trend continues.

The company has an established distribution network, and an extensive range of Amul products are distributed with regular periodicity. At the back end, raw milk is sourced from farmers who are long-term members of GCMME. This enables effective *coordination and governance* of the value chain; the wide range of Amul products provides a good incentive for the actors to engage with the value chain. It was found that retailers sell Amulspray at very low (even nil) margins to retain their customers. While this can work in the short term, it poses a challenge for the long term regarding sustainability of the value chain and availability of the product itself.

The study of Amulspray highlights how a cost-effective product for consumption targeted at low-income populations faces challenges in sustaining its credibility as a complementary food for children in the face of an influx of other competitors, in a scenario where none of them can legally promote their products. Neither availability nor affordability seem to be key influencing factors; even though other companies charge a higher price for their products, they are able to make them more desirable for consumers. Public policy can play an important role in creating an enabling *institutional environment* to overcome these constraints and *manage costs, risks, and uncertainty*; this will allow low-income consumers to benefit from the lower priced Amulspray. While poverty may be an important reason for not buying dairy products, there are other drivers (such as covert marketing and consumer awareness) which also influence consumer decisions. Given the ban on the promotion of infant foods, it should be difficult for new entrants to penetrate the market, but other brands have established their presence. Therefore, it is also important to examine the covert methods of market penetration discussed previously, which influence consumer decisions.¹³ The prohibition on the promotion of food for infants below two years is an important aspect of the *institutional environment* requirement on the supply side, determining the lack of promotion of the product.

5 Assessment of the two value chains

Amulspray presents an example of how a value chain can be helpful in increasing intake by poor consumers in a milk-deficient region, though not necessarily children: the cooperative supports the livelihoods of producer farmers as well. Amul can re-brand the product by manufacturing similar low-cost milk powder for older children. GCMME can promote products in this segment where there is no restriction, and reach a larger number of poor households.

Iron-fortified Tiger biscuits are an example of a private business value chain that can be leveraged for tackling hidden hunger. But it is a

product in an industry that seems to perceive a clear division between *mass* consumption and the *health and wellness* segments. Taste is seen as an important criterion for *acceptability*:

The health and wellness category of foods is primarily consumed by choice, not compulsion. The primary reason is taste. If it is not tasty, it will not be sold. Consumers may cut down on the frequency of consumption, but will not give up on taste. (Mayank Shah, executive, Parle Products (Nair-Ghaswalla 2012))

It is well argued that taste (*consumer acceptability*) is an important criterion for sustenance of food value chains. But there seems no evident reason for the change in the pro-nutrition focus of iron-fortified Tiger biscuits, other than business motives *vis-à-vis corporate responsibility* to address undernutrition. Going by the evidence from the efficacy trials, a thrust on branding iron-fortified Tiger biscuits as a nutritious product for the *mass* segment supported by nutrition awareness could perhaps have sustained the initiative and shown impact, without a major compromise on market share and profits.

Research suggests that it is not realistic to expect businesses to voluntarily address BoP distribution-related challenges without some degree of public support or a favourable institutional environment (Maestre *et al.* 2014). The absence of mandatory fortification regulation could be seen as a lacuna. Civil society can play a role in generating awareness and advocacy, influencing better social branding of businesses that aim to support, collaborate, and coordinate with efforts to combat malnutrition.

Both cases illustrate the importance of policy in leveraging commercial agri-food value chains to have a pro-nutrition and pro-poor focus. They are required to provide the *institutional environment* where more businesses are motivated to have nutritional targets (GloPan 2014). For instance, a policy requiring the mandatory iron fortification of biscuits may have sustained iron-fortified Tiger biscuits. The *institutional environment* includes the role of government agencies to facilitate informed choices by consumers to buy nutrient-dense food. In the absence of appropriate policy guidance, private business-led agri-food value chains may even pose challenges for public health.

In the case of iron-fortified Tiger biscuits, the absence of mandatory fortification or similar regulation made its withdrawal easy. In Amulspray's case, the ban on the promotion of infant foods has largely influenced it being used only as a dairy whitener, but affordable to poor households, even as new entrants have captured the infant food segment. Interventions on consumer awareness about fortification and even labelling using audiovisual and mass communication channels to reach illiterate populations could facilitate better informed choices by poor consumers. The India Spotlight Index Report of the Access to Nutrition Foundation highlights that the government has to play a key role 'in encouraging companies to scale up their efforts to solve the country's severe malnutrition challenge' (ATNI 2016b).

Governments can choose from options such as mandatory fortification, to increased consumer awareness, and increased engagement with private actors. Mandatory fortification, while important, has to keep abreast of changes in nutrition status and consumer needs, and be modified as required. The Government of India is taking measures in this direction. In 2017, the Food Safety and Standards Authority of India (FSSAI)¹⁴ released standards for the fortification of different foods and set up a Food Fortification Resource Centre portal. These measures indicate the government's acknowledgement of the role of market-driven value chains, and the need for an appropriate institutional environment to ensure their effective impact and in the desired directions.

6 Conclusion

The article has discussed the business models of two different fortified products and the challenges in their reaching poor households. Both value chains fulfil most of the requirements listed in the framework discussed in Maestre *et al.* (2017). The products of both companies have penetrated markets across urban and rural India, often seen as a big challenge for BoP products; using both traditional and modern value chains, these products are found in small shops, big retail chains, and also on online shopping platforms. The reach of the value chains and the nutritional content of the products indicate the potential to leverage them for enhanced nutritional intake by low-income and nutritionally vulnerable households.

However, the business rationale and business environment seem to be limiting their having a definite nutritional focus. This falls under the requirement of *institutional environment* for value chains that is influenced by formal and informal factors in the framework discussed in Maestre *et al.* (2017). A government role is called for here in creating the required institutional environment, and to reorient the value chains to target increased nutritional intake by the BoP.

In the case of iron-fortified Tiger biscuits, an enabling institutional environment could have ensured the continuity of an initiative that was showing potential to impact at scale. In Amulspray's case, it is governed by the international ban on the promotion of infant foods reinforced by the national legislation. This has led to its limited use as a complementary food and to alternative uses. But it is an accessible and affordable product that can get a thrust with better nutrition awareness. State support for initiatives to enhance consumer awareness about nutrition and packaged food can also facilitate informed choices by consumers, and will create a favourable *institutional environment* for businesses to focus on nutrition.

The BoP is a large market for the private sector in developing countries. It is imperative in this context that the state plays a proactive role in providing an enabling institutional environment that encourages private business to have a nutrition focus and promote public health at large.

Notes

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- † The authors are grateful to the editors of this issue of the *IDS Bulletin* and two anonymous referees for their very useful feedback and comments on earlier drafts of the article.
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