



FEED THE FUTURE
BUSINESS DRIVERS FOR FOOD SAFETY

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**The BD4FS Ambassador Firm Approach:
Example from a Dairy Value Chain in Senegal**

Technical Learning Note

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Cover photo:

A Laiterie du Berger milk collector receiving milk from pastoralist Fulani farmers in the Richard Toll area.

Photo credit: Mohamed Dia

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Acronyms

AFD: *Agence française de développement* (French Development Agency)

BD4FS: Business Drivers For Food Safety (A Feed the Future project)

CIRAD: *Centre de Coopération Internationale En Recherche Agronomique Pour Le Développement* (Center for International Cooperation in Agronomic Research for Development)

FES: Food Enterprise Solutions

GRET: *Groupe de Recherche et d'Échanges Technologiques* (Research and Technological Exchange Group)

LDB: *Laiterie du Berger* ("Berger Dairy")

TPA : *Transformation et partenariat en agroalimentaire* (Transformation and Partnership in Agrifood)

Glossary

Diw Nior: Diw nior or cow butter is often used in African kitchens to flavor dishes. It can also be used for skin and hair care.

Ferlo: The Ferlo is a semi-desert sylvo-pastoral zone in northeastern Senegal, consisting mainly of open shrub and tree savanna that is periodically subject to fire. This region owes its name to a small river, the Ferlo, which is a seasonal river in Senegal that gave its name to the Ferlo valley. It is also a tributary of the Taouey, and therefore a sub-tributary of the Senegal River. During the rainy season, it feeds the Guiers Lake. Work has been carried out to ensure that it has a regular flow throughout the year.

Richard Toll: Richard Toll is a town in north-western Senegal, close to Mauritania. In Wolof, the toponym means "Richard's garden", named after a French botanist, Jean Michel Claude Richard, who, from 1816, tried to acclimatize some European plant species there.

Tiakry: Sweet mixture of millet or wheat grains and yoghurt

Summary

Livestock farming is an important sector in the Senegalese agricultural economy. Traditionally, farmers in Senegal have owned cattle for a variety of purposes including milk, meat, draught power and milk processing activities. Under current conditions, milk is usually a by-product of livestock production and is often processed (into fermented products, i.e., yoghurt, cheese) to extend its shelf life for local consumption. But in the absence of a functioning cold chain¹ and inappropriate food handling, farmers struggle to reach more profitable markets for their fresh dairy products.

Dairy farmers in northern Senegal are pastoralists who travel nomadically and seasonally to find greener pastures for their animals. This makes it difficult for processors like Laiterie de Berger (LDB) to collect milk. Therefore, LDB has set up a collection system that allows independent or salaried collectors to collect milk from farmers every day by motorcycle or tricycle. LDB created a subsidiary company, Kossam SDE that provides milk collection and services to farmers in order to build their loyalty. Kossam SDE is an autonomous company resulting from the collaboration of LDB and the Association of Dairy Cooperatives. Since April 2019, it has taken over all the services provided by the dairy to breeders and producers, including collection. Kossam SDE depends on LDB's refrigerated collection centers.² There are a few collection centers in the region supported by international donors and Senegalese NGOs, however, LDB is the only business in the region capable of absorbing significant volumes.³

The Feed the Future Business Drivers for Food Safety (BD4FS) project in Senegal has recognized LDB as a leading firm or “Ambassador” in the dairy value chain. An “Ambassador firm” is a well-established business that has a branded product or products with a good local reputation, an established QMS (quality management system) and has either been certified or is working towards certification. These firms help BD4FS facilitate access to small and medium growing food businesses (GFBs) who are part of their supply or value chain(s). The primary mission of LDB is to connect rural milk supply to growing demand in urban areas. Through its signature co-design process, BD4FS and LDB reviewed potential points of contamination in the dairy value chain and recognized that producers—at the beginning of the value chain—required training and technical assistance in safer food handling.

This collaborative co-design experience with a lead firm in the dairy sector illustrates the effectiveness of the BD4FS Ambassador Firms approach⁴ where the targeted selection of GFBs within a value chain can successfully “pull” upstream actors (suppliers) to adopt safer food handling practices while simultaneously benefiting downstream actors who benefit from greater access to safer food.

Livestock Is an Important Sector of the Rural Economy

Senegal is a country where millions of livelihoods directly depend on smallholder livestock production. In 2016, total herd size in Senegal was estimated to include about 3,541 million cattle, 6,678 million sheep, and 5,704 million goats (National Agency of Statistics and Demographics, 2016). In Senegal, milk losses are estimated to be a staggering 50% of national production,⁵ amounting to 226.7 million liters in 2015. Latest available statistics (2017) indicate national demand to be 457.5 million liters per annum, averaging per capita annual consumption of 30 liters.⁶ Under the right conditions — incentives, infrastructure, and technical support — the milk sector in Senegal could potentially meet a greater proportion of the growing

¹ “The cold chain is a term applied to food handling and distribution where the product is maintained at suitable temperature conditions all the way from harvesting, through the cooling or freezing process to the point of sale.” The Cold Chain – Transport, Storage, Retail by G.F. Hundy, T.C. Welch, in *Refrigeration, Air Conditioning and Heat Pumps (Fifth Edition)*, 2016 (<https://www.sciencedirect.com/topics/engineering/cold-chain>)

² This idea has been raised in the context of cooperation with the Africa Milk project (<https://www.africa-milk.org/fr/about-the-project>). According to Eva Tournaire (https://agritrop.cirad.fr/595085/1/2019_MOQUAS_Tournaire_V2.pdf), there are many questions related to this approach:- location, sizing, operation, cost, advantages and limitations of such a system; and - by whom and how will these costs be covered? Tournaire, E. 2019. Dynamics of milk collection systems in Senegal, Case of the Laiterie du Berger and Kirène. Final dissertation. Page 19-43. - Dynamique des systèmes de collecte de lait au Sénégal -Cas de la Laiterie du Berger et de Kirène. Mémoire de fin d'études. CIRAD. Page 19-43. https://agritrop.cirad.fr/595085/1/2019_MOQUAS_Tournaire_V2.pdf

³ *ibid*

⁴ Food Enterprise Solution. 2022. Business Drivers for Food Safety Tools and Practices. Page 1. https://pdf.usaid.gov/pdf_docs/PA00Z7B9.pdf.

⁵ Freecold. 2019. Develop milk produced in Africa in the face of competition from the European industry. Développer le lait produit en Afrique face à la concurrence de l'industrie européenne. <https://www.freecold.com/developper-le-lait-produit-en-afrique-face-a-la-concurrence-de-lindustrie-europeenne/>.

⁶ Senegal Export. 2018. Milk sector in Senegal: so poor in its wealth. Filière lait au Sénégal : si pauvre de sa richesse. www.senegal-export.com/filiere-lait-au-senegal-si-pauvre-de-sa-richesse.html.

demand for dairy products among the growing urban middle class, as well as provide an affordable and safer product for nonfarm rural families. To fill the gap, Senegal imports milk and derived products. Nearly 50% of the national consumption of dairy products is imported, i.e., 209.3 million liters in 2017; it should be noted that milk powder accounts for 93% of dairy imports in Senegal.⁷ By modernizing and supporting the 200,000 dairy farmers, Senegal could truly benefit from a “dairy revolution.”

Traditionally, farmers in Senegal own cattle for various purposes — fresh milk, meat, draft animal power, dried meat and processed milk products (Somda and al., 2004). Livestock also function as both a source of savings and a symbol of the social status. Currently, producing milk for commercial sale is not a major livelihood activity for rural farmers in Senegal. Raw milk producers are mainly pastoralists, and in this context, livestock mainly provide economic security to households as “walking bank accounts”.

Two main livestock systems coexist in Senegal: the extensive grazing livestock systems found mainly in the drier northern areas and the more mixed agro-pastoral or semi-intensive systems in the center and south which are characterized by greater rainfall and therefore higher milk productivity. During the rainy season (June–November), the supply of milk exceeds the absorption capacity of dairies, in the central and southern regions, which leads to significant losses. Furthermore, in semi-intensive agro-pastoral systems, farmers do not depend solely on this activity. They practice cash crop agriculture, which provides income, but also provides fodder for animals.⁸

With regard to dairy processing in the northern areas, such as the Ferlo and the Senegal River valley, almost all families own animals, and despite low productivity per animal, the area has a milk surplus because the market has few outlets other than self-consumption by producer households. Given the lack of market access, the losses in the surplus supply of fresh milk are significant⁹. Milk is an ideal culture medium for rapid and vigorous microbial activity because of the absence of dry matter and ample water and nutrients. These hazardous microorganisms cause undesirable and toxic chemical and biological reactions (change in taste, texture, smell) that can be dangerous to human health. Immediately after leaving the udder, fresh milk contains few harmful microorganisms that can however quickly multiply if the milk is not properly handled during transport, processing, or storage, thus posing a risk to consumers.

In all the production areas of Senegal, fresh milk is processed to increase its shelf life and thus promote its consumption and sale. Processed milk products — curdled milk, cheese, and butter for example — enjoy strong demand in urban centers. However, getting these products from rural production areas to urban markets is challenging: the absence of efficient cold chain logistics and affordable transport that allows for the commercial collection from scattered producers means that urban food companies are turning to more accessible imported products such as powdered milk which also can be turned into curd, yoghurt, and other value-added products. The economic value of these imports in 2020 represented 348,388,053 USD for a quantity of 24.4 metric tons of milk.¹⁰

Laiterie du Berger: Connecting Rural Milk Supply to Urban Demand

Founded in 2007 and located in the town of Richard Toll, Laiterie du Berger (LDB) obtains fresh milk from more than 2500 local producers. It sells various dairy products such as whole fresh milk in bottles and cartons, yoghurt and “tiakry” (mixture of millet or wheat grains and yoghurt). Its “Dolima” branded products are available in supermarkets and small food shops. The dairy services LDB established in its facility have created new commercial impetus enhancing smallholders’ livestock production in the area. LDB provides farmers with veterinary and other extension services, milk collection, and market development whereby producers are subsidized with a package of inputs including animal feed.

⁷ ANSD. 2022. Economic and Social Situation of Senegal 2019- Chapter X: Livestock. Page 231. Situation économique et sociale du Sénégal 2019- Chapitre X : Elevage. Page 231. https://www.ansd.sn/ressources/publications/11-SES-2017-2018_Elevage.pdf

⁸ Ndiaye, A. 2006. Milk in the Income Diversification Strategies of Agropastoralists in the Fatick Region. Page 42. Le lait dans les stratégies de diversification des revenus des agropasteurs de la région de Fatick. Page 42. https://www.bameinfopol.info/IMG/pdf/mmoire4_A._Ndiaye.pdf

⁹ Broutin, C. et Diokhané, O. 2000. The “ Milk and dairy products sector in Senegal ” - final report of the exchange workshop March 30, 2000 - Organized by the national relay of the Technology and Partnerships in Agribusiness network TPA. Page 8. Filière « Lait et produits laitiers au Sénégal » - rapport final de l’atelier d’échanges 30 mars 2000 – Organisé par le relais national du réseau Technologie et Partenariats en Agroalimentaire TPA. Page 8. Dakar.

¹⁰ SikaFinance. 2022. Erratum, Senegal has spent more than 30 billion CFA francs on milk imports. Erratum, le Sénégal a dépensé plus de 30 milliards de FCFA pour ses importations de lait. https://www.sikafinance.com/marches/erratum-le-senegal-a-depense-plus-de-30-milliards-fcfa-pour-ses-importations-de-lait_32434

LDB collects from producers dispersed in areas poorly served by reliable transport routes. These producers, who are also breeders, are organized in a cooperative of more than 2500 people. LDB's services allow these breeders and producers to have regular additional income. Still, their approach does not fully prevent milk losses. This is due to several reasons:

- Risks of quality degradation: milk is sometimes left unchilled, in open containers for up to three hours before it enters the cold chain, enough time to become contaminated.
- Inappropriate practices pre-collection: Producers do not follow recommended breeding practices such as staggered calving periods during the year; they prefer to concentrate births in rainy season when natural pastures are green. This traditional practice allows them to feed the cows at the lowest cost and to produce enough milk to feed the calves,¹¹ however, the rainy season is a particularly wet period that fosters the development of germs and mastitis that can infect the milk.¹²
- Milking hygiene: handling and storage utensils, etc. if not properly cleaned can adversely affect milk quality even before it is collected.
- On-site storage: Most small dairy producers lack adequate storage and cooling facilities for their milk.
- Transportation infrastructure: Rural roads are many times far from electrical grids, frequently in a bad state, and can be impassable in the wet months which can negatively impact the quality of the milk collected.



BD4FS and LDB teams among the breeders. Photo credit: Mohamed Dia

LDB recognizes the importance of food safety and has embarked on a process of reducing risks of contamination in its collection and distribution system. Towards this end, Laiterie du Berger seeks to build the productive and handling capacity of the small-scale milk producers in its supply chain. Indeed, LDB provides services to farmers not only including organizing milk collection but also distribution of sugarcane straw as fodder, produced in abundance by the Richard Toll sugar company. Milk production, therefore, increases in the dry season, with controlled production cost; by rebalancing inputs, less expensive feed for more affordable fodder, it allows for an increase in milk production accompanied by a reduction in milk production costs.¹³

Their business aspirations are clear: “LDB’s products are sold in more than 12,000 points of sale and they work with 1,300 dairy farmers and suppliers, 50% of whom are women. LDB has enabled the creation of nearly 600 direct jobs. Thanks to the organization of collection, we are consolidating the milk supply of the extensive farming system, which is still very dispersed. Our goal is to connect local milk to the formal economy.”¹⁴

BD4FS Works with Local Champions to Impact Value Chains

BD4FS works with local business champions, like the Ambassador firms — that understand the importance of food safety to their bottom line — and provides food safety training to their suppliers to meet quality standards and comply with food

¹¹ Vall, E. 2017. To improve, in partnership with stakeholders, the efficiency of local dairy supply chains in West Africa by reducing losses and waste from production to consumption. Final report carried out as part of the GloFoodS Meta-program (March 2015 - December 2017). Page 7. - Améliorer en partenariat avec les acteurs l'efficience des chaînes d'approvisionnement laitières locales en Afrique de l'Ouest par la réduction des pertes et gaspillages de la production à la consommation. Rapport final réalisé dans le cadre du Méta-programme GloFoodS (mars 2015 – décembre 2017). Page 7. <https://www.inter-reseaux.org/wp-content/uploads/Rapport-final-projet-REGAL-Glofoods1.pdf>.

¹² Noriap Groupe. 2020. Dairy farming - 4 tips to avoid mastitis. Elevage laitier- 4 conseils pour éviter les mammites. <https://www.noriap.com/blog/%C3%A9levage-laitier-4-conseils-pour-%C3%A9viter-les-mammites>

¹³ Vall, E. 2017. To improve, in partnership with stakeholders, the efficiency of local dairy supply chains in West Africa by reducing losses and waste from production to consumption. Final report carried out as part of the GloFoodS Meta-program (March 2015 - December 2017). Page 7. - Améliorer en partenariat avec les acteurs l'efficience des chaînes d'approvisionnement laitières locales en Afrique de l'Ouest par la réduction des pertes et gaspillages de la production à la consommation. Rapport final réalisé dans le cadre du Méta-programme GloFoodS (Mars 2015 – décembre 2017). Page 7. <https://www.inter-reseaux.org/wp-content/uploads/Rapport-final-projet-REGAL-Glofoods1.pdf>.

¹⁴Diaw, A. Laiterie du Berger. 2021. Report of the webinar-Supporting the local milk sector in West Africa, 2021. AFD- Let's not export our problems- Mon lait est local. Page 5.- Rapport du webinaire- Soutenir la filière lait local en Afrique de l'Ouest.2021. AFD- N'exportons pas nos problèmes-Mon lait est local. Page 5. <https://www.cfsi.asso.fr/wp-content/uploads/2021/11/cr-webinaire-lait-20211207.pdf>



A BD4FS expert assisting in milking at the Richard Toll farmers. Photo credit: Mobamed Dia

safety protocols. This approach positively impacts the entire value chain as other suppliers are motivated to adopt promoted practices in order to become an authorized supplier to the Ambassador firm. During cocreation, BD4FS worked with the firm to analyze the most critical points of food safety vulnerability in their supply chain and identify training and capacity building opportunities for their employees and suppliers. To that end, BD4FS trained 374 producers, including 234 women and 131 young people. Topics included: hygiene practices, product handling, quality maintenance, and methods to improve the shelf life of products. The primary objective of the trainings is to build the uptake of food safety practices of milk producers to improve the safety as well as the quality of their milk to sell to LBD. Raising awareness and increasing

knowledge about food safety and food handling of dairy products was key to achieving this objective. The first part of the training entailed sensitizing producers on food safety, particularly by improving their knowledge of good hygiene practices for milk collection. Then conveying easy-to-implement food safety practices followed. Dairy men and women have reported that BD4FS trainings have had a positive impact by increasing their knowledge of proper food safety practices. Building the capacity of local producers through the LDB partnership offers the potential for milk producers to have a regular income each month. The producers of the region, primarily the Fulani women, will have met their daily expenses due to the steady income from LDB as well as selling surpluses at a higher retail price (from door-to-door markets)¹⁵ that they can now command because of better quality milk.¹⁶ Beyond raw fresh milk, there is more market potential for value-added, processed dairy products. For example, traditional curdled milk sold in small quantities in Dakar at high prices is widely available in secondary towns and rural markets at very competitive prices. Moving it to urban markets where demand, and consequently prices, are higher is the challenge. Other traditional products such as artisanal butter or "*div nior*" (butter oil) are also present in small quantities but could most likely be expanded with the right support.¹⁷ These foods are in demand in the cities, but the distances between the production sites and the cities contribute to their scarcity. Improving the sanitary quality of these dairy products may improve handling and preservation methods, reduce losses, and promote an increase in income through the sale of products with greater added value while helping to reduce the risk of contamination.

Conclusion

By supporting LDB, the BD4FS project contributes to improving quality in the milk value chain in the Richard Toll area of northern Senegal. Beyond capacity building for growing food businesses, BD4FS also works with local business champions so that the positive effects of promoting food safety are passed on to all the actors and helps to expand the “food safety culture” of Senegal. In 2022, BD4FS trained 3,500 agrifood production actors in milk, meat, egg, fish, fruit and vegetable value chains in Senegal.

Focusing on the role of GFBs in improving food safety, the FES team contributes to USAID's knowledge base, strategies, and methodologies for enterprise-level assistance in food systems. BD4FS's mission is to provide technical assistance and capacity building, develop best practices from lessons learned, and generate success for entrepreneurs working to improve food safety.

¹⁵ Tournaire, E. 2019. Dynamics of milk collection systems in Senegal, Case of the Laiterie du Berger and Kirène. Final dissertation. Page 31. - Dynamique des systèmes de collecte de lait au Sénégal - Cas de la Laiterie du Berger et de Kirène. Mémoire de fin d'études. CIRAD. Page 31. The prices are: Retail: 500FCFA/L or 0.79USD/L; Sales to LDB 200FCFA/L or 0.32 USD/L

https://agritrop.cirad.fr/595085/1/2019_MOQUAS_Tournaire_V2.pdf

¹⁶ Tournaire, E. 2019. Dynamics of milk collection systems in Senegal, Case of the Laiterie du Berger and Kirène. Final dissertation. Page 37. - Dynamique des systèmes de collecte de lait au Sénégal - Cas de la Laiterie du Berger et de Kirène. Mémoire de fin d'études. CIRAD. Page 37.

https://agritrop.cirad.fr/595085/1/2019_MOQUAS_Tournaire_V2.pdf

¹⁷ Portail agroalimentaire du Sénégal. 2015. Surplus milk is sometimes processed using traditional skills and the dairy products sold in urban centers. Even if they have a high added value, they remain scarce for the following reasons: 1) a fragmented and infrequent supply; 2) supply chain not connected by an organized distribution circuit; and 3) lack of adequate packaging.

The support would require better organization of the distribution channels following the example of what the LDB does to connect the milk produced in remote areas to the demand in cities. <https://www.agroalimentaire.sn/4-consommation-et-marche/>¹⁷

The vision of BD4FS is that food safety management should be tailored to the needs of the interested food company.¹⁸ Therefore, co-creation with the growing food business is the pillar of the BD4FS intervention approach. This diversity of needs across sectors and enterprises feeds the project's learning system about what are truly the business drivers for food safety.

This experience with LDB, which is still ongoing, already shows how the involvement of private sector ambassador businesses, through better organization of food value chains, can contribute to improving food safety. Indeed, raw material suppliers are trained by BD4FS, as part of the technical assistance, on the best ways to improve their products in line with the specifications of their industrial client. BD4FS, through its co-creation approach, responds specifically to the needs identified by the beneficiaries. This approach has the merit of promoting not only awareness of health and economic risks, with 69% of beneficiaries remembering the key messages delivered during training, but also the adoption of good food safety practices. In 2022, of the 3678 beneficiaries of BD4FS training, 81% have adopted at least one good safety practice. The combined action of the ambassador companies and BD4FS on the value chains will impact producers through better control of food losses and, on the economic level, income generation, especially for women producers. BD4FS, in addition to the growing food businesses it supports, will continue to work with leading companies to help promote a culture of food safety at the grassroots level.

¹⁸ Food Enterprise Solutions. 2020. The Business of Food Safety. <https://www.agrilinks.org/post/business-food-safety-0>