

Etat des filières laitières dans les 15 pays de la CEDEAO, de la Mauritanie et du Tchad

Annexe 10 : Fiche Nigéria

J.C. Dagorn

Juillet 2018



The dairy value chain in Nigeria



Jean Cyrille Dagorn

July 2018

Avertissement

Ce rapport Nigéria constitue l'un des treize documents nationaux servant de base au rapport de synthèse sur les « Etude relative à la formulation d'un programme régional de promotion des chaînes de valeur lait local au sein de la CEDEAO, de la Mauritanie et du Tchad » (Corniaux et al, 2018). Il a été réalisé pour le compte du Hub Rural dans le cadre de l'Offensive Lait portée par la CEDEAO. Cette étude s'articule autour de deux principales activités :

- Le diagnostic des filières laitières dans la zone CEDEAO, de la Mauritanie et du Tchad ;
- La programmation des actions et des investissements.

Ce présent travail s'intègre dans la première activité. À l'échelle du Nigéria, l'objectif est d'actualiser les données et les informations relatives :

- aux statistiques sur l'élevage et sur les filières laitières (production, importations, consommation) ;
- aux projets et aux investissements en cours ;
- aux politiques publiques à l'œuvre.

Table of Contents

| | |
|---|----|
| Table of Contents | 4 |
| Résumé (en français)..... | 6 |
| Introduction..... | 11 |
| Dairy consumption in Nigeria | 12 |
| Global dairy consumption..... | 12 |
| Low dairy consumption per capita | 12 |
| Dairy products in Nigeria..... | 13 |
| Dairy production in Nigeria | 15 |
| Annual dairy production | 15 |
| Milking herd size in Nigeria | 16 |
| Milk yields | 16 |
| Typology of production systems | 17 |
| Characteristics and constraints of the traditional pastoral cattle raising systems in terms of milk production and valorisation : | 19 |
| Constraints and limits that also affect non-pastoral systems (commercial farms, peri-urban and smallholder dairy farms) :..... | 20 |
| Government and partners' action on dairy production in Nigeria. | 21 |
| Opportunities and recommendations for increasing milk production in a sustainable way :23 | |
| Policies and plans : | 23 |
| Milk Collection in Nigeria | 25 |
| Milk collection is marginal in the country | 25 |
| Actors of (formal) milk collection in Nigeria | 25 |
| Lessons from the assessment of milk collection in Nigeria | 26 |
| Milk collection costs | 28 |
| Key challenges in milk collection in Nigeria | 29 |
| Current and future milk collection mechanisms of 3 major milk collectors:..... | 29 |
| Milk processing in Nigeria | 35 |
| Actors of milk processing in Nigeria : | 35 |
| Fresh milk processing in Nigeria | 35 |
| Challenges face by the dairy industry to develop fresh milk processing in Nigeria:..... | 36 |
| Dairy imports in Nigeria..... | 37 |
| Dairy supply gap in Nigeria..... | 37 |
| Imports of dairy products in Nigeria | 37 |
| Milk powder and fresh milk..... | 40 |
| Public policies related to the cost of dairy imports :..... | 41 |
| Recommendations by local stakeholders with regards tariffs on milk powder imports :.... | 42 |
| Nigeria's dairy market | 43 |
| Value of the dairy market in Nigeria | 43 |
| General trend : the dairy market is growing | 43 |
| Characteristics of the Nigerian dairy market..... | 44 |
| Structure of the market in relation to consumers:..... | 45 |
| Where consumption items (and probably dairy) are distributed and sold in Nigeria: | 45 |
| Drivers of dairy market sales: The main constraint lies in the price of dairy products. | 45 |
| Perspectives on the dairy market sales in the future:..... | 46 |
| Market perspective on the development of dairy farming and production in Nigeria:..... | 46 |

| | |
|--|----|
| Dairy sector in Nigeria: A value chain synthesis | 48 |
| Identification of bottlenecks and challenges in the value chain | 48 |
| Conclusion on the dairy value chain in Nigeria..... | 51 |
| Appendix 1: Currency exchange rates | 53 |
| Appendix 2: Price assessment of dairy products in SPAR supermarket in Lagos City, Nigeria, July 2018..... | 55 |
| Appendix 3: Price assessment of dairy products in Shoprite supermarket in Lagos City, Nigeria, July 2018..... | 57 |
| Appendix 4: List of persons contacted/met for the study | 61 |
| Appendix 5: Bibliography..... | 62 |

Résumé (en français)

Il existe peu de données fiables et vérifiées sur la chaîne de valeur du lait au Nigéria. Le rapport cherche donc à analyser le secteur laitier au Nigéria de la production à la transformation, pour mieux comprendre sa situation actuelle, les acteurs impliqués et les contraintes auxquelles ils font face.

Une consommation de produits laitiers reposant sur les importations de poudre de lait.

Le Nigéria est un marché majeur de consommation de produits laitiers en Afrique, notamment en Afrique de l'Ouest, avec une demande totale estimée à plus de 1 milliards de litres par an. Toutefois, la consommation par habitant reste faible, à moins de 10 litres/an en moyenne, et les Nigériens ne consomment pas forcément du lait tous les jours. Les produits laitiers sont essentiellement consommés sous forme de poudre de lait ou de lait condensé pour ajouter aux boissons chaudes ou préparer des boissons pour les enfants. Le yaourt liquide et les boissons lactées aromatisées sont également des produits consommés, notamment dans les centres urbains.

Une production de lait dans le pays provenant essentiellement des communautés pastorales.

Il est difficile de mesurer la production annuelle de lait au Nigéria, car la majorité du lait produit est consommé sur place ou commercialisé informellement à proximité des communautés d'éleveurs. D'après les estimations de la FAO, la production moyenne de lait entre 2011 et 2016 a été de 554 000 tonnes par an. Cette production serait assurée par un peu plus de 2 millions de vaches laitières parmi le total de 19-20 millions de vaches élevées au Nigéria, avec une production annuelle par vache d'un peu plus de 200 litres. Les systèmes pastoraux, transhumants ou sédentarisés, produisent la vaste majorité (95%) du lait produit au Nigéria. Le reste provient de quelques dizaines de fermes laitières de taille moyenne (plus de 50 vaches) et quelques très grandes fermes (plus de 500 vaches). Les fermes péri-urbaines de petite taille mais adoptant les mêmes caractéristiques de spécialisation technique en production laitière que les grandes fermes, semblent se développer, et sont encouragées par les grands acteurs de la collecte de lait (FrieslandCampina WAMCO, Arla).

Les principales contraintes affectant la production de lait au Nigéria sont les suivantes:

- Une faible production de lait par vache, notamment en raison de leur mode d'élevage, de leur état de santé, de leur potentiel génétique ;
- La non-collecte ou transformation du lait du fait du manque d'infrastructures routières et d'électricité dans le pays ;
- Les tensions et conflits entre pasteurs et agriculteurs qui sont très présents dans le débat politique et médiatique ;
- Les difficultés d'accès durable et constant à des pâtures et de l'eau pour le bétail ;
- Le coût des intrants, notamment l'alimentation, pour assurer l'augmentation de la production laitière ;
- Le manque de connaissances spécifiques des producteurs en production laitière ;
- Le manque d'accès au financement pour les producteurs.

Le gouvernement fédéral du Nigéria a présenté en 2018 un Plan national de transformation de l'élevage qui vise notamment à augmenter la production de lait. Le plan est centré sur la sédentarisation des pasteurs et la structuration de la production laitière, de la collecte et de la transformation en partenariat avec le secteur privé. Le développement de ranches dans 94 sites dans 10 Etats du pays est le point central du plan. D'un point de vue technique, l'augmentation attendue de la production repose notamment sur le croisement des races locales avec des races laitières, et sur la production commerciale de fourrages. Des appuis de la FAO et de la Banque mondiale sont attendus dans les prochaines années

pour mettre en œuvre ce plan, tandis que le secteur privé doit apporter des investissements notamment pour développer la collecte et la transformation de lait.

Les laiteries impliquées dans la collecte de lait, spécifiquement FrieslandCampina WAMCO, Arla, L&Z Farms, insistent sur le fait d'augmenter la production laitière mais également sur l'amélioration de la qualité du lait en termes de contenu bactériologique. FrieslandCampina et Arla développent différents types d'appui technique (sur l'alimentation, la production de fourrages, la gestion des veaux, la traite, etc.) aux producteurs pastoraux pour l'intensification de la production. Ils misent également sur le développement de nouvelles fermes sédentaires spécialisées en production laitière, qui peuvent notamment attirer des personnes non issues des communautés pastorales.

Collecte : une faible proportion du lait produit entre dans les canaux formels de transformation.

On estime qu'environ 50 000 tonnes de lait, soit 10% de la production annuelle, sont collectées pour entrer dans le circuit de transformation formel (hors de la communauté pastorale), ce qui représente une très faible proportion de la demande nationale formelle en produits laitiers. Les pasteurs fourniraient la moitié de ce lait, et les fermes laitières spécialisées l'autre moitié. Les principaux collecteurs de lait au Nigéria sont la multinationale hollandaise FrieslandCampina WAMCO dans l'Etat d'Oyo, la fédération de producteurs Milcopal dans l'Etat de Kaduna, et quelques fermes laitières intégrées "collectant" leur propre lait pour leur propre système de transformation, dont au moins une, L&Z Farms, collecte du lait de communautés pastorales environnantes.

| Entreprise | Collecte de lait par jour (L) | Dont lait issu des pasteurs (L/jour) | Collecte de lait annuelle estimée (L) | Localisation au Nigéria (Etat) |
|-------------------------------------|--------------------------------------|---|--|---|
| FC WAMCO | 6 000 | 6 000 | 2 190 000 | Oyo (5 centres de collecte) |
| MILCOPAL (en partenariat avec Arla) | 3 000 | 3 000 | 1 095 000 | Kaduna (2 centres de collecte) |
| L&Z Farms | 2 000-3 000 | 2 000-2 500 | 1 095 000 | Kano (4 centres de collecte, et à la ferme) |
| Integrated Dairies | 3 000-4 000 | | 912 500 | Nasarawa |
| Nagari | 1 500-2 000 | ? | 638 750 | Nasarawa |
| Maizube | 1 200-1 500 | | 492 750 | Niger |
| Sabore | 1 200-1 500 | | 492 750 | Adamawa |

Tableau : Inventaire partiel de la collecte de lait en 2018 au Nigéria

La multinationale pan-européenne Arla a commencé un partenariat avec Milcopal dans l'Etat de Kaduna, est en train de construire des accords avec une grande ferme intégrée possédant son outil de transformation dans l'Etat de Kwara, et va développer la collecte de lait produit par des éleveurs pastoraux dans l'Etat d'Oyo.

Les coûts de collecte estimés ou visés par FC WAMCO et Arla sont de 20 NGN/L, et de 80 NGN/L pour L&Z Farms. FC WAMCO dispose de 5 centres de collecte de 12 000L de capacité dans l'Etat d'Oyo, qui alimentent un centre de regroupement dans le même Etat. Les producteurs, en majorité des pasteurs, amènent le lait jusqu'aux centres de collecte. Le lait est ensuite transporté jusqu'à l'usine de FC WAMCO à Lagos, capitale économique et principal port pour l'importation de poudre de lait, au Sud-Ouest du Nigéria. Arla envisage un système différent pour ses futurs projets, sans centre de regroupement, mais avec une unité de transformation dans chacun des 3 Etats visés (l'usine de MILCOPAL dans l'Etat de Kaduna, l'unité de transformation de Godilogo Farms dans l'Etat de Kwara, une future usine dans l'Etat d'Oyo). Les centres de collecte seront équipés de machines à traire, et les pasteurs amèneront leur troupeau jusqu'au centre de collecte pour les traire sur place. Le lait sera ensuite transporté directement des centres de collecte vers une des 3 usines de transformation. L&Z Farms fonctionne avec des centres de collecte où les producteurs amènent leur lait, comme FC WAMCO, mais n'a pas de centre de regroupement. Le lait est directement amené à la ferme de L&Z.

Les grands défis identifiés par les collecteurs de lait sont la qualité du lait (avec des taux de bactéries bien au-dessus d'un seuil raisonnable de 100 000/L), la régularité de l'approvisionnement du lait (du fait de la faible production par vache, de lactations courtes et de la saisonnalité de la production avec la saison sèche, et à cause de pratiques de revente de lait au niveau local à des collecteurs locaux).

La transformation laitière au Nigéria

On estime que plus de 80 entreprises nigérianes ou étrangères fabriquent des produits laitiers au Nigéria. Les principales activités de transformation sont le réensachage de poudre de lait importée, son utilisation pour la fabrication de lait condensé, et dans une moindre mesure la fabrication de yaourt liquide. Quelques grandes industries, principalement des multinationales laitières (FrieslandCampina WAMCO, Arla, Ornua, FAN Milk-Danone, Chellarams, Oldenburger, Regal Foods, etc.) ou des biens de consommation (Nestlé, PZ Cussons, CHI, Promasidor) transforment plus de 50 000 litres en équivalent lait par jour chacune, et contrôlent la majorité du marché laitier.

Du lait produit au Nigéria est transformé par quelques fermes laitières verticalement intégrées disposant de leurs outils de transformation, et par quelques usines qui travaillent de 1 000 à 5 000 litres en équivalent lait par jour. La grande majorité de ces acteurs ont recours à la poudre de lait dans leur transformation. Le lait frais est en général transformé soit en lait pasteurisé ou en yaourt liquide (Dans le cas d'Arla pas sous sa propre marque, mais sous celles des laiteries avec qui la multinationale est en affaires). FrieslandCampina WAMCO intègre 10% de lait frais dans la fabrication de son lait condensé Peak. A l'avenir, la multinationale aimerait également démarrer une ligne spécifique de yaourt à base de lait frais, tandis qu'Arla envisage que le lait frais collecté soit utilisé pour du yaourt et éventuellement du lait UHT. Le principal défi pour le développement de la transformation de lait frais est qu'il n'existe aucun segment du marché laitier dans lequel la poudre de lait n'est pas déjà utilisée. Certaines femmes Fulani utiliseraient de la poudre dans la fabrication de produits traditionnels, ainsi que des fermes-laiteries ou des coopératives initialement concentrées sur la production/collecte de lait frais pour le transformer. La vente de lait frais n'est pas réellement développée au Nigéria au-delà de canaux informels autour des communautés Fulani. Par ailleurs, les produits laitiers issus de lait frais sont relativement chers et ne sont pas distribués largement, notamment à cause de limitations sur la chaîne du froid. La consommation de produits laitiers est déterminée avant tout par le prix, un élément sur lequel le lait frais ne peut s'aligner sur la poudre de lait. Il y a un attachement d'une partie de la population, notamment dans le Nord, pour le lait frais, mais également un intérêt croissant pour les notions de traçabilité et de qualité sanitaire des produits, qui peut jouer en faveur comme en défaveur du lait local.

Importations laitières au Nigéria

Le Nigéria est un importateur majeur de poudre de lait (en provenance de Nouvelle Zélande, Union Européenne et Australie), et le premier importateur de poudre de lait réengraissée en Afrique (en provenance d'Union Européenne). Le Nigéria reste un pays faiblement exportateur de produits laitiers, notamment parce que les pays voisins disposent eux-mêmes d'accès à la poudre de lait européenne ou néozélandaise importée sans passer par le Nigéria. Les estimations varient du simple au double, mais on peut considérer que l'estimation d'importations annuelles de plus de 1 000 000 de tonnes en équivalent lait est crédible. Cela correspond au double de la production estimée de lait au Nigéria. Le Nigéria importe avant tout de la poudre de lait entier, deux fois plus que la poudre de lait écrémé. On ne dispose pas d'estimations d'importations de poudre de lait réengraissé, mais elles sont possiblement aussi importantes que celles de poudre de lait écrémé. Sur la base des statistiques FAO et de Trademap, on peut estimer que le Nigéria a importé pour près de 536.9 million US\$ (191 milliards NGN ou 440 milliards Francs CFA) de produits laitiers (hors poudre de lait réengraissé) entre 2011 et 2016. Certains acteurs du secteur citent des chiffres plus élevés, 600 millions US\$ (214 milliards NGN ou 321 milliards Francs CFA) ou 1,3 milliards US\$ (464 milliards NGN ou 696 milliards Francs CFA). La poudre de lait était 75% moins chère que le lait local jusqu'à la dépréciation monétaire de 2016. Elle est désormais plus de 10% moins chère que le lait frais, tout en offrant des avantages de stockage et de prévisibilité de qualité. Les importations sont soutenues par le gouvernement nigérian, qui a abaissé les tarifs de 10% à 5% sur les importations de produits laitiers en octobre 2016. Certains acteurs locaux du lait, notamment ceux réunis au sein de la CODARAN (Commercial Dairy Ranchers' Association) réclament d'ajouter une taxe de « développement des produits laitiers » de 15% sur l'ensemble des importations de produits laitiers afin de financer un fonds de soutien au développement de la production, collecte et transformation de lait frais au Nigéria.

Le marché laitier au Nigéria

Le secteur laitier est considéré comme le deuxième segment en valeur dans le marché de la nourriture et des boissons au Nigéria. Sa valeur oscille entre 280-840 millions US\$ (100-300 milliards NGN ou 150-450 milliards de Francs CFA) et 2 milliards US\$ (714 milliards NGN ou 1 072 milliards de Francs CFA) selon les estimations. Ces chiffres ne tiennent pas compte de la valeur de la majorité du lait produit au Nigéria et qui n'entre pas dans les canaux commerciaux formels. Le marché des produits laitiers s'est développé de manière régulière depuis 10 ans (en dehors de la récession de 2016-2017). Il est attendu que cette croissance se poursuive, du fait de la conjonction de l'augmentation de la population, de son urbanisation, et de l'importante proportion d'enfants.

Le marché reste largement dominé par la poudre de lait, qui représenterait plus de 50% de la valeur du secteur, et dans une moindre mesure le lait condensé. Ces produits sont en effet disponibles partout dans le pays, sans chaîne du froid, et dans des volumes minimes que les consommateurs pauvres, qui représentent la majorité des consommateurs nigériens, peuvent acheter. Le marché des produits laitiers est ainsi avant tout déterminé par le prix de vente et la possibilité d'acheter des petites portions. FrieslandCampina WAMCO est le principal acteur du marché avec sa marque Peak de poudre de lait et lait condensé. La firme hollandaise et son rival Promasidor contrôlèrent ensemble près de 70% des ventes du marché laitier.

Il est attendu que la demande pour des produits laitiers "haut de gamme" tels que la glace, les yaourts et les boissons lactées aromatisées, continue à augmenter avec l'émergence d'une classe moyenne urbaine. Il existe une demande potentielle pour du lait frais ou des produits qui en sont issus, notamment le yaourt ou la glace (intérêt pour les produits nourrissants, mode des produits laitiers, attachement au lait dans le Nord du pays, etc.), mais les deux contraintes que sont la disponibilité d'électricité pour maintenir la chaîne du froid des laiteries jusqu'aux consommateurs, et l'état des routes détermineront si cette demande se réalise. Pour l'instant, le lait frais est essentiellement présent dans le segment haut de gamme des yaourts liquides, segment sur lequel sont présents des fermes laitières commerciales intégrées possédant leurs unités de transformation (L&Z, Nagari, Nyiyia, Integrated Dairies, etc.).

Les défis et contraintes de la chaîne de valeur du lait local au Nigéria.

Des défis et obstacles à lever existent à tous les niveaux de la chaîne de valeur laitière au Nigéria, même si les questions d'amélioration des routes, de développement d'un réseau électrique fiable et d'accès au financement sont transversales. Au niveau de la production, les principaux défis à relever résident dans l'instrumentalisation de la question de la production laitière dans les débats politiques existants autour du pastoralisme et de la sédentarité ou mobilité des communautés Fulani, dans l'accès sécurisé et garanti aux moyens de production (herbe, eau, résidus de cultures ou sous-produits agro-industriels) pour les troupeaux, et dans l'apprentissage de compétences spécifiques à la production laitière. La collecte souffre à la fois d'un manque de soutien pour investir dans des équipements adéquats, d'un coût de collecte fort en raison de l'irrégularité et de la faiblesse de la production laitière, et de difficultés à assurer un niveau de qualité bactériologique du lait satisfaisant. La transformation de lait local au Nigéria est avant tout contrainte par le fait que la poudre de lait est systématiquement moins chère, plus accessible, de qualité plus régulière et plus facilement stockable que le lait frais. Il y a peu de produits où le lait frais se démarque nettement de ceux issus de la poudre de lait. Seule une politique volontariste d'incitation et de valorisation de la transformation de lait frais serait à même de créer un changement significatif. Dans le domaine de la distribution et de la commercialisation, les enjeux transversaux de facilité de transport et de chaîne du froid par l'électricité sont les principaux obstacles au développement de produits laitiers à base de lait local, avec le corollaire des garanties sur la qualité sanitaire du lait.

Des possibilités d'action existent pour développer le secteur laitier local au Nigéria.

Le potentiel de développement du marché laitier au Nigéria est reconnu par tous, et le gouvernement est déterminé à agir sur la question de l'élevage, notamment en raison des tensions entre agriculteurs et pasteurs. L'élaboration d'une stratégie de développement de l'élevage laitier devrait à la fois contribuer à la sécurisation du pastoralisme sans chercher à exclusivement résoudre les tensions existantes. Elle pourrait se concentrer sur les moyens de soutenir l'accès aux moyens de production pour les éleveurs, et chercher à tirer parti des potentielles complémentarités entre élevage et agriculture dans le pays, ainsi qu'encourager l'investissement et la structuration de la collecte et la transformation de lait local. Des options telles que les achats publics, des quotas d'incorporation de lait local, des politiques de soutien financier conditionnées à la collecte de lait local, ou des politiques tarifaires sur les importations pourraient être envisagées pour développer une demande industrielle de lait local.

Introduction

The development of the dairy value chain is an immense challenge in Nigeria, and a key to poverty alleviation and food security. A high number of pastoralist producers rely on livestock production (mostly for meat, with milk being often seen as a by-product) and consume high quantities of the milk they produce as a source of proteins. On the other hand, most non pastoralist Nigerians resort to imported milk powder or evaporated milk (made with imported milk powder) to avail of cheap proteins. It would then seem that the development of milk production and fresh milk processing in Nigeria could allow to support pastoral communities build their livelihoods, reduce the dependency of the country on food imports, and bring healthy and nutritious products to urban consumers. Besides, with violent tensions and killings between herders and farmers in some parts of Nigeria over the past years, the future of pastoralism and livestock production is a key issue in the current political debate in the country. Discussions on the future of dairy in Nigeria therefore take place in this specific context. The present study looks at the different challenges and opportunities that characterise the dairy value chain in Nigeria, and examines the positions and recommendations made by stakeholders in the dairy value chain. It is expected to inform experts and decision-makers on the development of the dairy sector in the country. Dairy consumption, milk production, milk collection, dairy processing, dairy imports, the dairy market are analysed in separate chapters before a synthesis on the dairy value chain wraps up the main elements of the study.

Dairy consumption in Nigeria

Global dairy consumption

Nigeria is a major market for dairy in Africa, and especially in West Africa. Estimates of national demand for dairy products vary a lot in the existing literature (see table 1 below), but it can be safely considered that the demand for dairy products in Nigeria largely exceeds 1 billion litres/1 million tonnes annually and is bound to increase in view of the ongoing population increase, and changes of consumption patterns due to the urbanisation of the population and the development of a middle class¹.

| Source | Annatte ² | Ayok ³ | Dairy Chain ⁴ | FMARD (APP 2016-2020) ⁵ | FMARD at Milky Way Abuja workshop ⁶ | PWC ⁷ | CODARAN ⁸ |
|----------------------------|----------------------|-------------------|--------------------------|------------------------------------|--|------------------|----------------------|
| Year of publication | 2012 | 2013 | 2014 | 2016 | 2016 | 2017 | 2018 |
| Estimate in tonnes of milk | 1,300,000 | 1,700,000 | 1,100,000 | 2,000,000 | 1,300,000 | 1,700,000 | 1,825,000 |

Table 1: Estimates of the quantity of dairy consumption per year in Nigeria.

Low dairy consumption per capita

In general, milk consumption per person is very low in most parts of Nigeria. In the Northern States where there is a tradition of livestock production and milk consumption, especially among the Fulani communities, people consume an average of 50 litres per-person each year⁹. Across the whole of the country, the annual per capita consumption remains lower than the Africa's average estimated at around 37 litres/person¹⁰, and much lower than the world average of more than 80 litres of milk equivalent/person¹¹. Estimates of national yearly average of per capita consumption in Nigeria vary

1

Makun, H., Dairy production systems in Nigeria, slide presentation, 2018.

2 Annatte, I. Fatima, B.A.; Wambai, Y.; Ruma, B.; Gideon, M.M.; Lawal, U.S; Lawrence, O.I; Aligana, M.; Shoffela, A.K.; Mark, L.K.; and Kasim, H.I., Major issues in Nigeria dairy value chain development, Vom Journal of Veterinary Science, vol. 9, pp.32-39, 2012.

3 Ayok, C., *ibid*.

4 <http://www.businessdayonline.com/morecompanies/real-sector/article/frieslandcampina-wamco-aggressive-expansion-close-700m-litre-milk-gap/>

5 Federal Ministry of Agriculture and Rural Development, The Agriculture promotion policy (2016-2020), Policy and strategy document, 2016.

6 <http://shipsandports.com.ng/nigeria-reduce-importation-dairy-products/>;
<http://www.tribuneonline.ng.com/amp/37719/>

7 PWC, Transforming Nigeria's agricultural value chains, A case study of the cocoa and dairy industries, 2017.

8 CODARAN, Policy actions suggestions for a sustainable livestock industry in Nigeria, Submission to FAO Africa Sustainable Livestock 2050, 2018.

9 Annatte, I. et al, *ibid*

10 <https://www.ft.com/content/31e29eb4-96a1-11e6-a80e-bcd69f323a8b> ; <https://www.africa.com/dairy-consumption-in-africa-part-1/> and <http://aaj.tv/2014/07/ethiopias-dairy-consumption-lowest-in-africa/>

11 FAO, World agriculture: Towards 2015/2030, An FAO perspective, 2003: <http://www.fao.org/3/a-y4252e.pdf> ; International Dairy Federation, The world dairy situation 2015, Bulletin of the International Dairy Federation 485/2016 : <https://www.idfa.org/docs/default-source/d-news/world-dairy-situationsample.pdf>

between 10 litres/person¹² and 20 litres/person¹³ (see table 2 below). A national average consumption of 10 litre/capita/year appears as the most widespread estimate, and one that would confirm a global dairy consumption of around 1,8 billion litres per year (For a population estimated at almost 180 million people).

It is considered that everyone knows dairy products in urban areas, as they are widely present on market stalls and shop shelves, but only a minority of consumers can afford to buy them regularly. For most town dwellers, the only kind of milk they can buy for their families is the powdered variety, based on imported milk powder, and sold in small portions or reconstituted to liquid milk¹⁴. However dairy-based products are popular for children, and brands have been developing smaller packages and diverse dairy-based products to attract a larger audience and reach the poorest urban consumers¹⁵.

| Source | Arla (citing FAOSTAT) ¹⁶ | Annatte ¹⁷ | Ayok ¹⁸ | CODARAN at FAO ¹⁹ | CODARAN ²⁰ | Makun ²¹ |
|---------------------------|-------------------------------------|-----------------------|--------------------|------------------------------|-----------------------|---------------------|
| Year of estimation | 2011 | 2012 | 2013 | 2018 | 2018 | 2018 |
| Estimate in L/capita/year | 8 | 20 | 10 | 10,13 | 3,65 | 10 |

Table 2: Estimates of per capita dairy consumption in Nigeria.

Dairy products in Nigeria

- Fresh milk produced by pastoral families or some commercial farms is primarily consumed by children from pastoralist families or neighbouring communities, especially in the North of the country. Traditional milk products usually processed by Fulani women include nono (sour milk), kindirmo (sour yoghurt), manshanu (local butter), chukwi (Fulani cheese) and wara (Yoruba cheese)²².
- The great majority of dairy products traded on formal markets are made from imported milk powder. The most widely consumed dairy products are milk powder for children or for tea/coffee (whole milk powder, skimmed milk powder, fat filled milk powder or baby formula), cans of evaporated or condensed sweetened milk, yoghurt, and flavoured milk drinks. Milk powder indeed accounts for 61% of the turnover in the industry²³.
- Ice cream is a growing segment but not as widespread as the ones previously mentioned. Sour milk, butter milk, cream, butter, clarified butter, cheese, and ultra-high temperature (UHT) treated milk are minor in the dairy consumption patterns in Nigeria²⁴. Outside of the

12 Ayok, C., *ibid.*. And Makun, H., *ibid.* And CODARAN, Key policy thrusts for the dairy sector, Presentation to the Federal Ministry of Industry, Trade and Investment, 2018.

13 Annatte, I. et al, *ibid.*

14 Annatte, I. et al, *ibid.*

15 *Ibid.*

16 Arla, Human rights impact assessment in Nigeria, 2015.

17 *Ibid.*

18 Ayok, C., *ibid.*

19 CODARAN, Policy actions suggestions for a sustainable livestock industry in Nigeria, Submission to FAO Africa Sustainable Livestock 2050, 2018.

20 CODARAN, Strategic growth actions for Nigeria's commercial dairy sector, 2018.

21 Makun, H., *ibid.*

22 Ayok, C., *ibid.* And Makun, H., *ibid.* And PWC, *ibid.*

23 Ayok, C., *ibid.*

24 Annatte, I. et al, *ibid.* And Arla, *ibid.*, p.22.

traditional products processed by pastoral families, dairy is primarily consumed in the form of milk powder (whole milk powder or fat filled milk powder).

Dairy production in Nigeria

Annual dairy production

Annual dairy production in Nigeria cannot be precisely measured as most of the milk produced comes from pastoral herds and is consumed by the pastoral families, or sold in the neighbouring communities in the form of milk or traditional processed products. There is no production of other milk than cow milk (despite significant numbers of goats and sheep raised in the country²⁵). Estimates of cow milk production vary between 400,000 tonnes and 700,000 tonnes per year (see table 3 below).

| Source | Annatte ²⁶ | Ayok ²⁷ | Arla ²⁸ (referring to Augusto & Co. Ltd) | Dairy Chain ²⁹ | FMARD (APP 2016-2020) ³⁰ | FMARD at Milky Way Abuja workshop ³¹ | PWC ³² | CODARAN ³³ |
|----------------------------|-----------------------|--------------------|--|---------------------------|-------------------------------------|---|-------------------|-----------------------|
| Year of publication | 2012 | 2013 | 2013 | 2014 | 2016 | 2016 | 2017 | 2018 |
| Estimate in tonnes of milk | 600,000 | 570,000 | 591,470 | 400,000 | 600,000 | 700,000 | 600,000 | 520,000 |

Table 3: Estimates of cow milk production in Nigeria according to various sources.

Dairy expert Celestine Ayok³⁴ and FAO estimates consider that the production has rather steadily increased from less than 400,000 tonnes of milk in 2000 to more than 500,000 tonnes per year since 2011. Based on FAO estimates³⁵, the average milk production in Nigeria between 2011 and 2016 amounts to around 554,000 tonnes per year :

25 Ilu, I. A. Frank, and Annatte, I., Review of the livestock/meat and and milk value chains and policy influencing them in Nigeria, FAO and ECOWAS, 2016.

26 Annatte, I. et al, *ibid*

27 Ayok, C., *ibid*.

28 Arla, *ibid*.

29 <http://www.businessdayonline.com/morecompanies/real-sector/article/frieslandcampina-wamco-aggressive-expansion-close-700m-litre-milk-gap/>

30 Federal Ministry of Agriculture and Rural Development, *ibid*.

31 <http://shipsandports.com.ng/nigeria-reduce-importation-dairy-products/>;
<http://www.tribuneonline.ng.com/amp/37719/>

32 PWC, *ibid*.

33 CODARAN, Policy actions suggestions for a sustainable livestock industry in Nigeria, Submission to FAO Africa Sustainable Livestock 2050, 2018.

34 Ayok, C., *ibid*

35 FAOSTAT, calculations by the author.

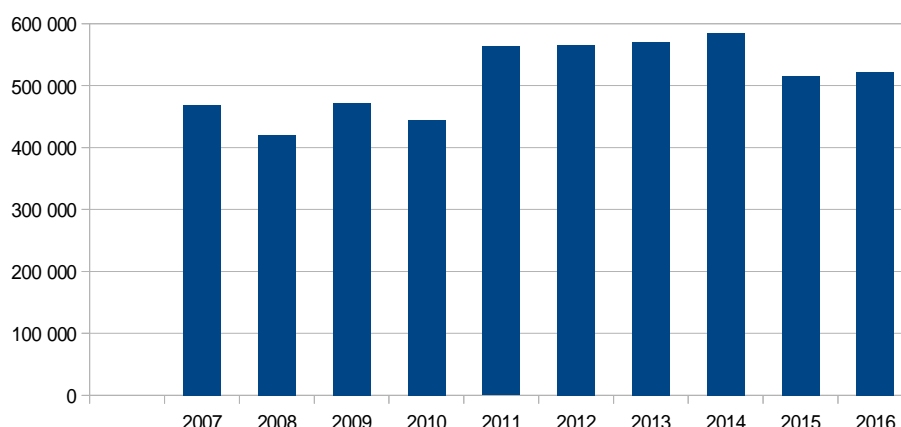


Table 4: Cow milk production (in tonnes) in Nigeria according to FAO estimates (FAOSTAT)

Milking herd size in Nigeria

Estimates of the number of cows producing milk in Nigeria vary from 900,000³⁶ to more than 4 million heads.³⁷ out of the estimated 19-20 million cattle raised in the country³⁸. Among the about 16 million cows (85-90% of the total) raised by pastoralists or smallholder farmers, some produce milk at some point in the year as they are lactating after calving, but very few of them are actually specialised in milk production³⁹. The rest of the cows (Around 3 million cows) are held by medium and large scale farmers in managed pastures⁴⁰, but most of them for beef production. Several documents and experts use the figure of 2,37 million cows involved in dairy production, a figure that would be consistent with a total annual milk production of around 554,000 tonnes per year (see table 4) and a production per cow slightly higher than 200L/year. There are more than 50 million goats and 30 million sheep in Nigeria, but they are considered to contribute to milk production⁴¹.

Milk yields

Despite significant variations in estimates, one could consider that cows in Nigeria produce on average less than 2 litres per day during their lactating time, and down to about 0.5 litres during the dry season⁴². Cross breeds are said to reach up to 8-18 litres per day with the proper conditions of feeding and water supplies⁴³, and pure milking breeds (Friesian, Swiss Brown, Jersey, etc.). more than 20 litres per day.

36 Annatte, I. et al, *ibid*.

37 Arla, *ibid.*, citing FAO, Aregheore, E., Country Pasture/Forage Resource Profiles. Nigeria. 2009

38 Ayok, C., *ibid.*; Makun, H., *ibid.*; FMARD, *ibid.*; <https://beverageindustrynews.com.ng/index.php/2018/03/08/fg-sets-up-committee-to-create-policy-framework-to-boost-dairy-industry/>. However Annatte, I., et al mention industry sources that estimated Nigeria's national herd at 14 million heads, including approximately 900,000 milking cows. The FAO estimated in 2009 that 4 million cattle out of the 19 million cattle living in Nigeria were used for dairy production (FAO, Aregheore, E., Country Pasture/Forage Resource Profiles. Nigeria. 2009, mentioned by ARLA, *ibid.*).

39 Blench, R., Traditional livestock breeds: Geographical distribution and dynamics in relation to the ecology of West Africa, Overseas Development Institute, 1999.

40 CODARAN, Strategic growth actions for Nigeria's commercial dairy sector, 2018, and Makun, H., *ibid*. See also: <https://beverageindustrynews.com.ng/index.php/2018/03/08/fg-sets-up-committee-to-create-policy-framework-to-boost-dairy-industry/>

41 Ilu, I. A. Frank, and Annatte, I., Review of the livestock/meat and and milk value chains and policy influencing them in Nigeria, FAO and ECOWAS, 2016.

42 Makun, H., *ibid*.

43 Ayok, C., *ibid.*, and Annatte, I., et al, *ibid*.

Typology of production systems

Dairy production in Nigeria takes place under two distinct types of production systems⁴⁴:

- Pastoralist cattle raising systems, that account for 95% of Nigerian milk production. There is an often ignored diversity of choices and options⁴⁵ (in terms of mobility, size of herds, use of inputs, ownership of land, production of milk, development of other livelihood activities, etc.) among the 12 million small-scale Fulani pastoral producers⁴⁶ in Nigeria, but 2 archetypes can be described in terms of implications on cattle raising and milk production :
 - Systems of non-settled Fulani nomads using indigenous cattle breeds (Bunaji, Rahaji, & Gudalis), mostly fed with natural grasses and other roughages gotten from grazing areas, grazing reserves or harvested fields. The cows are moved around to find pasture during the dry season. Herds can go up to 300 heads. The cows are not specialised in milk production and mostly generate income from the selling of meat. They produce between 0,5 and 1L per day, or a bit more during the cropping season. The milk is consumed and processed locally without entering the commercial channels⁴⁷.
 - Systems run by settled or semi-settled Fulani pastoralists who raise mostly indigenous cattle breeds (Bunaji, Rahaji, & Gudalis), with herds ranging from 20 to 100 head alongside arable production. The cows are reared both for milk and meat production. Herds are fed on natural grasses, roughages, crop residues. Some supplementary feeds and veterinary inputs can be sometimes used⁴⁸. Milking cows are milked once a day and calves are separated from the mothers at night. Some of the cows can be moved around during the dry season. The production of milk per cow remains at around 1 to 3 L/day. Most of this milk is consumed, processed and sold locally. Some of it is collected and sold to intermediaries or dairy companies.

44 Makun, H., *ibid.*; Ayok, C., *ibid.*; PWC, *ibid.*

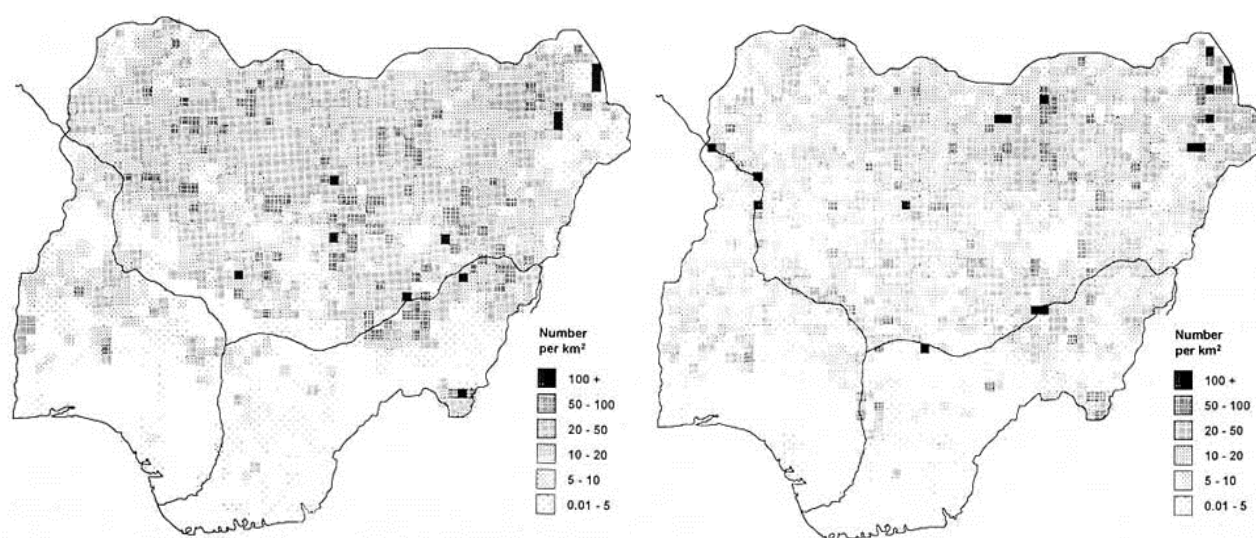
45 Blench, R., *ibid.*

46 Ayok, C., *ibid.*

47 Makun, H., *ibid.*; Ayok, C., *ibid.*

48 Ayok, C., *ibid.*

Maps 1 and 2: Wet season (left) and dry season (right) distribution of cattle in Nigeria in 1994⁴⁹



49 FAO, Nigerian Livestock resources Survey, in Identification and characterization of West African Shorthorn cattle, 1994: <http://www.fao.org/livestock/agap/frg/FEEDback/War/t1300b/t1300b00.htm#Contents>

- A few tens of large scale intensive dairy farming aimed at formal commercial channels, who produce less than 5% of Nigerian milk production⁵⁰, with herds of more than 50 and up to 1,000 cattle consisting of a mixture of local, imported (Holstein Friesian, Brown Swiss, Simmental, Jersey) and cross-breeds of cattle. Commercial farms generally include mechanised milking, supplementary animal feed, as well as veterinary inputs and artificial insemination⁵¹. Processing facilities sometimes exist on the farm. Zero grazing can be practiced on some of the farms, with provision of high quality sugar soluble grasses like Napier grasses and supplementation with cereal and oil-rich agricultural by-products and mineral licks⁵². A significant number of these farms belong to wealthy and influential people in Nigeria (ex-head of federal state, ex-ministers, ex-senators, ex-governors) and most of the farms are not the main livelihoods of their owner⁵³. There are very few big ranch operators (like Nyaya Group that would have a herd of 7,000 cattle), and a handful of medium sized ranches. Celestine Ayok estimated in 2014 that there were 28 commercial farms (Including Zaidi, Garka, Inter-City, Joda) in Nigeria, and 12 vertically integrated dairy companies that also produce milk (L&Z, Majestik, Farm Fresh, Milky Way, Sebare, Nagari, Jamil, Niyya, Shanga, Mai Zube, Tilde, Lamda)⁵⁴.

Hussaina J. Makun from the National Animal Production Research Institute (NAPRI)⁵⁵ distinguishes an emerging third category of urban or peri-urban farmers who raise small herds (5 to 20 animals) of cross-breed cows in systems that take some characteristics of the commercial dairy farms: fencing of the land, purchase of crop residues and agricultural by-products to feed the cows, practice of artificial insemination, vaccination, hiring of employees, etc. Cows can produce up to 5 litres of milk per day. Milk is not processed in a traditional way and can be sold to aggregators or to neighbouring families. Manure needs to be managed as zero grazing can be practiced.

Programmes of dairy farming development such as those started or planned by FrieslandCampina WAMCO and Arla will partly rely on the development of new specialised smallholder dairy farms run and managed by people who want to get into dairy farming. Technical support and clustering should lead to the development of dairy zones where dairy farming is practised in a specialised way (fencing, milking parlours, cooling systems, use of silage and other feed, use of veterinary inputs, calf management, cross-breeding, etc.), This should therefore lead to the development of production systems that are close to the peri-urban-urban category of dairy farmers described above.

Characteristics and constraints of the traditional pastoral cattle raising systems in terms of milk production and valorisation :

As mentioned above, milk production is most often a by-product of meat production in pastoral cattle raising. It would however be possible to increase milk production by pastoral communities if some challenges were addressed. Secure and durable access to grazing areas and water all year long is pointed by numerous stakeholders as the key limiting factors to increasing milk production in pastoral systems. But a number of other constraints affect pastoralists and hence their ability to contribute to milk production:

- Cattle productivity is low due to the incidence of diseases, high reproductive wastage, low calving rate, no selection of cows based on their milk production (low genetic potential), and low milk

50 Ayok, C., *ibid.*; PWC, *ibid.*

51 Ayok, C., *ibid.*

52 Makun, H., *ibid.*

53 Based on research on some of these farms and discussions with cattle raising stakeholders in Nigeria in July 2018.

See also Forrest, T., *The advance of African Capital: The growth of Nigerian private enterprises*, 1994. pp.49-50.

54 Ayok, C., *ibid.*

55 Makun, H., *ibid.*

yield per lactation (due to lack of feed/energy spent on mobility, low nutrition of cows, etc.)⁵⁶. Cross breeds would require more feeding to produce more milk, and can still be sensitive to disease and heat stress and could not sustain the mobility of purely nomadic systems.

- The lack of power supply and poor road infrastructure in many cattle raising hamper the production, cooling and transportation of milk. A significant part of the milk produced is wasted and not consumed⁵⁷.
- There are growing tensions and conflicts between nomadic pastoralists and crop farmers due to competition on land⁵⁸ and water resources (Due to population growth, urbanisation, climate change and the expansion of crop farming)⁵⁹. Any policy or discussion on the future of dairy takes place in this context where the issue of pastoralism is highly politicised and tense in public debates.
- For many smallholders, increasing milk production requires a high cost of inputs (fodder, agricultural by-products, concentrate, veterinary services, equipment) and transport, with uncertain selling perspectives (with delayed and irregular payments). From a value chain point of view, milk is therefore a costly output⁶⁰.
- There is a lack of organised dairy producer cooperatives. Pastoralists are not organised as a commodity (milk) association, because milk is not a main production/output for them.
- Milking herds are dispersed over large areas costing, therefore making economies of scale for the costs of access to inputs (concentrates, fodder, veterinary services, etc.) impossible.
- Lack of knowledge and skills in specialised dairy farming practices and herd management.
- Low quality of milk produced in terms of bacterial content, thus bringing constraints on milk collection and processing possibilities.
- The general level of poverty and lack of access to funding for pastoralists prevent from investing in equipment or facilities to improve milk production and milking.

Constraints and limits that also affect non-pastoral systems (commercial farms, peri-urban and smallholder dairy farms) :

- Cost of feed and inputs
- Lack of knowledge and skills in dairy farming and dairy cattle management
- Lack of power and supply and poor road infrastructure
- Low milk yield per cow (due to poor feeding, low quality and/or quantity of water supply, diseases,
- Challenges in accessing funding to acquire intensive dairy farming equipment (equipment for pasture production and feed production, milking machine, cooling tanks, etc.)
- Challenges in accessing semen and bulls to practise cross-breeding of local breeds with more dairy-oriented breeds.
- Challenges in handling the distribution and selling of fresh milk and/or processed milk (Partly due to lack of cooling systems, poor road infrastructure, and irregular or low milk production).

56 CODARAN, Policy actions suggestions for a sustainable livestock industry in Nigeria, Submission to FAO Africa Sustainable Livestock 2050, 2018; Arla, *ibid.*; Interviews with stakeholders in Nigeria in July 2018.

57 CODARAN, Key policy thrusts for the dairy sector, 2018; Interviews with stakeholders in Nigeria in July 2018. .

58 Muhammed, I., Ismaila, A.B., Bibi, U.M., An assessment of farmer-pastoralist conflict in Nigeria using GIS, International Journal of Engineering Science invention, vol.4, Issue 7, July 2015. pp. 23-33.

59 CODARAN, Strategic growth actions for Nigeria's commercial dairy sector, 2018; Interviews with stakeholders in Nigeria in July 2018.

60 *Ibid.*

Government and partners' action on dairy production in Nigeria.

There is no specific dairy farming or dairy sector plan or strategy in Nigeria. Dairy is often addressed as one element of livestock and/or pastoralism plans and policies.

Public policies on livestock and pastoralism since the 1970s

In Nigeria large surfaces of land and corridor routes were secured in 1970s to allow pastoral herds to move around South during the dry season and have access to grass and water. These measures were also aimed at ensuring that relations between sedentary farmers and mobile herders could remain peaceful and complementary in terms of sharing of land and water resources. If grazing reserves still exist in many Northern states in Nigeria, the lack of infrastructure (for power, for access to water, road infrastructure, public facilities, etc.) has not made the reserves attractive enough for cattle raisers to consider the possibility to settle permanently or semi-permanently in these reserves. Besides, access routes and grazing reserves have been partly taken over in many places due to urbanisation, growing population, and the development of crop farming, while climate change and conflict in the North East of Nigeria has forced pastoralists onto different routes and sometimes further South to seek pasture for their herds⁶¹.

There have been programmes attempting at developing dairy production in Nigeria, with an emphasis on artificial insemination to cross breed local cows with Western dairy breeds like in the 2004-2006 Nigerian Dairy Enterprises Initiative supported by USAID⁶². The Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) conducted studies in the years 2000 and recommended the establishment of specialised dairy production zones, in addition to existing pastoral models⁶³.

Nowadays, political discussions and public debate on the development of dairy production in Nigeria take place in the tense context of numerous clashes between the herders, farmers, and the military in several States in Nigeria (Including Benue State and Plateau State). Cattle rustling and burning of herders' temporary settlements in farming areas have been reported, while killings of farmers have been blamed on herders. Several States (Like in Benue State) adopted anti-grazing laws that make it impossible and illegal in practice for pastoralists to move into these states with their herds. Livestock development and dairy production plans by the government are therefore announced with the specific aim of solving the herders-farmers crisis by pushing pastoralists settle down in ranches or grazing reserves and to stop open grazing practices.

The 2018 National Livestock Transformation Plan⁶⁴

- The plan to create ranches for the settlement of nomadic pastoralists has been presented several times by the Federal Government as a way to address the clashes and conflicts between some herders and some crop farmers. In 2014, a federal programme to encourage States to support the establishment of mini-ranches had been launched, but civil society organisations recently pointed at the non-implementation of that plan⁶⁵. The 2016-2020 Agricultural Promotion Policy⁶⁶. Already stated the need to create commercial ranches to retain cattle.
- Since the end of 2017, the government has been working on an updated ranching policy through consultations between the federal government and the national Economic Council, and a stakeholder's committee⁶⁷ set up in March 2018. The committee was tasked with developing a

61 Muhammed, I. et al, *ibid*.

62 Annatte, I. et al, *ibid*.

63 *Ibid*.

64 Federal Government of Nigeria, The national livestock transformation plan, media presentation, 2018.

65 <http://nigeriantimes.ng/news/group-wants-jonathan-prosecuted-over-cattle-ranch-funds-protests-at-nass/>

66 Federal Ministry of Agriculture and Rural Development, *ibid*.

67 <https://beverageindustrynews.com.ng/index.php/2018/03/08/fg-sets-up-committee-to-create-policy-framework-to->

policy framework to boost the dairy industry, with the objective to attract and achieve local participation in the dairy business; ensure local content development of dairy; encourage joint venture opportunities across strategic segments of the dairy industry and provide financial relief to boost local growth through the participation of women and youths in the sector. Members of the committee were drawn from public agencies and ministries (Federal Ministry of Industry, Trade and Investment, Federal Ministry of Agriculture and Rural Development, the Raw Materials, Research and Development Council and the National Animal Production Research Institute, Nigeria Customs Service, Central Bank of Nigeria, National Agency for Food Drugs Administration and Control, Bank of Industry, Bank of Agriculture) and private sector groups such as the Commercial Dairy Ranchers Association of Nigeria (CODARAN), FrieslandCampina WAMCO, Promasidor, Arla Foods, L&Z Farms.

- The national Livestock Transformation Plan was presented in May 2018. It aims at transitioning pastoralism to ranching in order to reduce the struggle for common resources, and creating ranches in 94 locations in 10 states of Nigeria in order to improve livestock productivity through breed improvement, pasture production, as well as efficient land and water productivity
- A Ranch Design Plan proposes models of various sizes clustered in 94 locations in 10 pilot states (Adamawa, Benue, Ebonyi, Edo, Kaduna, Nasarawa, Oyo, Plateau, Taraba and Zamfara). In terms of size, the proposed size of ranch models varies from 30 to 60, 150 or 300 cows per ranch. Ranches should be linked with gazetted (formally registered) grazing reserves. Breeder ranches of at least 1,000 cows should also be set up in 7 of the 10 pilot states.
- As far as dairy is concerned, the milk output of the plan is expected to be in excess of 200 million litres by the 2nd year of the project and 700 million litres of milk by the 4th year of the project.
- The plan will cost around NGN179 billion (CFA Franc 268.5 billion or Euro 412 million⁶⁸) over 10 years. The funding by the federal government and the States for the first 3 years of the pilot phase total about NGN70 billion (CFA franc 105 billion or Euro 161 million). Public Private Partnerships are expected to support funding for the plan.

Support of international partners towards the Federal Government's plans on ranching

Towards a future Livestock productivity and resilience support project with the World Bank⁶⁹

The World Bank is in principle opposed to supporting the forced settlement of pastoral communities, but is working on a livestock value chain programme that de facto supports a lot of aspects of the federal government of Nigeria's National Livestock Transformation Plan. The future programme (US\$ 200 million) will focus on the productivity and resilience of livestock value chains. The project will include the design of a Livestock Master Plan that should shape the long-term livestock policy of the Nigerian government, including in dairy. The programme should start in 2019 and would focus on pushing breed improvement through artificial insemination, develop a livestock data management information system, develop commercial pasture production, develop biogas systems, increase the production and use of vaccines, support the scaling up of the use of feed and agricultural and industrial by-products, supporting the creation of dairy producer associations. Other dimensions of the project (linking pastoral farmers to markets through contracting with dairy companies, establishment of milk collection centres and milking parlours in peri-urban areas, creation of Livestock Service business Groups and Livestock Service Centres) focus on non-production related aspects of the dairy value chain.

FAO's support to the establishment of ranches.

[boost-dairy-industry/](#)

68 Average exchange rates based on the period from July 24th to July 23rd, 2018 have been used based on information gotten from www.oanda.com. See Appendix 1.

69 <https://leadership.ng/2018/07/19/world-bank-fg-roll-out-200m-livestock-production-project/>; <https://www.vanguardngr.com/2018/07/ondo-state-govt-partners-world-bank-fg-on-livestock-project/>; Discussions with stakeholders in July 2018.

The Food and Agriculture Organisation of the United Nations (FAO) will support the Nigerian government in setting up livestock ranches in several states, including Niger State, in the country. One key area of intervention will consist in supporting the cross-breeding of local White Fulani cows with dairy specialised breeds. Another area of focus will be to increase the capacity of pasture by intensifying pasture production and increasing the provision of supplementary feeds and agricultural by-products. It is considered that pasture can currently accommodate for 1 cow/ha, while it could in the long term increase up to 5-10 cows/ha.

Opportunities and recommendations for increasing milk production in a sustainable way :

Based on discussions with stakeholder sand the analysis of their plans and recommendations, a number of measures are needed to increase milk production in milk production in Nigeria :

- **Increase milk yields per cow and the regularity of milk production throughout the year by improving feeding and dairy farming management:** It is considered that with proper feeding and water, dairy cattle management and less energy spent on mobility, local breed white Fulani cows could increase their average daily milk production from less 1L/day to almost 4 L/day.⁷⁰ Daily milk production by cross-breeds could in the medium term reach 10L/day.
 - Securing access to grass and water for cattle on the land they can access (gazetted grazing reserves and other lands that can be allocated to cattle herders in the long term without conflicts).
 - Support the replanting of trees and other measures and practices that can restore ecosystems and improve the long term availability of grass and water in Northern Nigeria.
 - Structure and develop mechanisms to encourage the use of agricultural by-products at reasonable cost for dairy farming.
 - Support for the establishment and management of pasture to produce hay or silage.
 - Support the structuration of a supply chain of feed for dairy cows.
 - Develop skills, knowledge and improve practices in terms of calf management, grazing management and general cow management
 - Structure veterinary and extension services for dairy farmers.
- **Support the improvement of milk quality** (In terms of bacterial content, non-contamination with water, antibiotics content) :
 - Develop technical support and training on dairy farming practices, including on milking and milk management.
 - Increase the availability of milking equipment and cooling equipment to be used by milk producers.

Policies and plans :

In general, beyond the measures and actions mentioned above, the development of the dairy production in Nigeria will require the lifting of some infrastructural barriers, coherent government investments and policies to support the sector⁷¹:

- Development of a specific dairy production policy: Given that the development of dairy production will require public investments and actions (securitisation of land and water access, road infrastructure, power supply, extension services, etc.) and the structuration of a value chain by identifying and lifting specific bottlenecks, with the participation of numerous stakeholders (pastoralists, « new » dairy farmers, commercial farms, banks and finance

⁷⁰ Annatte, I. et al, *ibid*.

⁷¹ Annatte, I. et al, *ibid*.

institutions, dairy collectors and processors, etc.), a detailed policy that determines achievable priorities is needed to guide public and private actors decisions, investments and actions. This policy should go beyond the general principles laid out in the 2018 National Livestock Transformation Plan (see below).

- Establishment of updated data on cattle numbers and characteristics, milk production, demand for milk, and existence and lack of infrastructure,
- Implementation of concrete measures and investments to upgrade existing available land (especially gazetted grazing reserves) with water and power supply, road infrastructures, milking and cooling equipment and basic facilities for interested producers to settle in on a permanent or seasonal basis.
- Establishment of a curriculum, specific courses in existing programmes, or and education and training programme to improve knowledge and skills in dairy cattle management, dairy production, cross-breeding, etc., for producers, producer organisations, extension officers and vets.
- Establishment or reinforcement of the existing structures (Including the National Animal Production Research Institute in Kaduna State, and the National Veterinary Research Institute in Plateau State the North of Nigeria) that can support the availability of semen and artificial insemination, bulls for cross-breeding, seeds for pasture crops, and inputs for animal health.

Priorities and plans on milk production for major local milk collectors in Nigeria :

Arla and FrieslandCampina WAMCO put an emphasis on the improvement of dairy management and practices (pasture production, silage making, calf management, milking practices, etc.) to increase the production of milk per cow and to improve the quality (bacterial content) of the milk collected. Various support in terms of extension services, demonstration on model farms, technical advice by the dairy companies or partners (Including a feed supply company) is provided or planned to be provided. Flattening the seasonality curve of milk production is also an objective for both dairy companies, in order to encourage the maintaining of reasonable levels of milk production during the dry season. Both companies consider that milk production can be increased with the current local breed cows, but plan to support further cross breeding with milking breeds. Reaching a production per cow of 8-10L/cow is considered achievable in the medium-term by the companies. It is hoped that in the long run, milk producers will pay for the technical support, equipment (milking parlours, etc.) and services they get from the companies or from their partners (feed companies, etc.). As of now producers don't pay for the inputs that are provided to encourage them to produce more milk. The two companies also make use of their position as off-takers to support producers' access to funding to invest in dairy production equipment and services.

L&Z Farms supports pastoralist farmers that supply the dairy farm with milk through joint action with the State government (that provided land for pastoralists) and development partners. L&Z Farms set up a source of water and started supporting farmers for the production of fodder. Pastoralists can use this production of pasture either to feed their own cows, or to sell it to other producers.

Milk Collection in Nigeria

Milk collection is marginal in the country

There are no exhaustive milk collection data in Nigeria, but dairy experts agree that a small percentage of milk produced in Nigeria is aggregated and collected through formal organised dairy processing channels. Most of the around 500,000 tonnes of fresh milk produced annually is either consumed locally or processed by the pastoralist women into sour milk, yoghurt or cheese and traded within the producing communities or on nearby open markets within a distance of 5 to 15km⁷². This milk has therefore often been sold outside of the family cell and collected before being processed by either a female member of the community or neighbouring community. It is however not considered as having been collected to enter the formal dairy value chain channels (Where processing is conducted by dairy farms, small dairy companies or multinational firms).

A reasonable gross estimate of the volume of milk collected in formal channels in Nigeria would be 50,000,000 litres (50,000 tonnes⁷³) of milk per year, equivalent to almost 10% of the estimated average milk production in the country. Consulting firm PWC⁷⁴ considers that half of that volume is provided by commercial farms and half by pastoralists. That amount of formal milk collection represents less than 3% of the estimated global demand for dairy in Nigeria.

Actors of (formal) milk collection in Nigeria⁷⁵

- Some individual aggregators buy milk from pastoralist producers and sell it to dairy companies.
- Vertically integrated dairy farms, about a dozen of them in Nigeria, are involved in milk collection as far as their own milk (produced on the farm) is concerned. Milk is then processed on the farm. A few of them (Especially L&Z Farms, but also Nagari Integrated Dairy⁷⁶) collect milk from neighbouring pastoralist communities.
- Cooperatives: There are few milk collection and bulking centres managed by dairy cooperatives. The Kaduna Federation of Milk Producers' Cooperative Association Ltd (MILCOPAL) was created in the 1990s as an apex organisation for 36 milk producer associations that had been established at the initiative of the National Livestock Projects Division of the Federal Ministry of Agriculture⁷⁷.
- FrieslandCampina WAMCO, who is owned by the Dutch dairy cooperative FrieslandCampina, has been collecting fresh milk from pastoral communities in Oyo State since 2011⁷⁸. In a Memorandum of Understanding signed with the Federal government of Nigeria in 2011 and renewed in 2016, FC WAMCO committed to reach 10% of local procurement for their dairy processing in Nigeria. It was estimated in 2016 that about 3% of their processing volume came

72 Annatte, I. et al, *ibid.*; Arla, *ibid.*

73 Based on interviews with dairy production and processing practitioners in Nigeria in July 2018.

74 PWC, *ibid.*

75 Ayok, C., *ibid.*

76 https://www.livestockinternational.nl/upload_mm/a/8/2/1047b261-1a55-43d1-82a7-b48ab1d271ef_AAAFinalBaselineReportIFDC-WAMCO.pdf

77 http://unaab.edu.ng/wp-content/uploads/2009/12/455_FST%20405%20Lecture%202%263%20note-Dr%20Obadina.pdf; IFDC, Dairy Development Programme in Nigeria, Baseline report, key findings and recommendations, 2012.

78 The company collected milk from intensive dairy farm Rosedael Farm in Kwara State from 2010 to 2013, but then stopped.

from fresh milk⁷⁹.

- Pan-European dairy cooperative Arla is in partnership with the Kaduna federation MILCOPAL (see above), and is planning to collect milk in Kaduna State (Through MILCOPAL), in Oyo State and from an existing large-scale dairy farm (Rosedale Farm) in Kwara State.
- The National Animal Production Research Institute (NAPRI) collects some milk from neighbouring farming communities in Zaria, Kaduna State⁸⁰.
- Most national and multinational dairy companies do not collect any fresh milk and work exclusively with milk powder.
- A number of small-scale and medium-sized processing units with capacity to process from 50 to 5,000 liters per day collect milk from Fulani communities in the North of the country⁸¹. There is no information regarding their number and the volume of milk they collect.

Lessons from the assessment of milk collection in Nigeria

Our literature review, contacts with dairy companies and farms and discussions with dairy experts in Nigeria have only allowed to account for a minimal part of the estimated 50,000,000-litre yearly milk collection in the country :

| Company | Milk collection per day (L) | Including milk from pastoral farmers (L/day) | Estimated milk Collection per year (L) | Location |
|-------------------------------------|------------------------------------|---|---|--|
| FC WAMCO | 6,000 | 6,000 | 2,190,000 | Oyo State (5 milk collection centres) |
| MILCOPAL (in partnership with Arla) | 3,000 | 3,000 | 1,095,000 | Kaduna State (2 collection centres) |
| L&Z Farms | 2,000-3,000 | 2,000-2,500 | 1,095,000 | Kano State (4 milk collection centres and on the farm) |
| Integrated Dairies | 3,000-4,000 | | 912,500 | Nasarawa State |
| Nagari | 1,500-2,000 | ? | 638,750 | Nasarawa State |
| Maizube | 1,200-1,500 | | 492,750 | Niger State |
| Sabore | 1,200-1,500 | | 492,750 | Adamawa State |

Table 5: Non exhaustive assessment of some milk collection by dairy companies and vertically integrated farms in 2018

It is however expected that dairy companies FrieslandCampina WAMCO and Arla, vertically integrated dairy farms L&Z Farms, Integrated Dairies, Nagari Integrated Farm, Maizube Farm, and Sabore Farm

⁷⁹ PWC, *ibid*. The percentage has not been confirmed by the company during interviews in 2018.

⁸⁰ IFDC, *ibid*.

⁸¹ Arla, *ibid*.; Ayok, C., *ibid*.

are among the major producers and collectors of fresh milk in Nigeria in 2018. They together account for a bit less than 7 million litres per year, including 60% (a bit more than 10,000 litres per day or about 4 million litres per year) from pastoral farmers. Other vertically integrated dairy farms have been contacted or assessed but they are not producing and collecting milk at the moment, either because they stopped after challenges in dairy production or processing, or because they process dairy but haven't developed yet a lactating herd. Celestine Ayok, dairy consultant and dairy processing operator, estimated in 2014 that there were 28 commercial dairy farms in Nigeria who produced milk and were collected by vertically integrated dairy farms of dairy processors. It has not been possible to find nor contact these farms.

Map 3 : Location of the assessed vertically integrated farms, cooperatives and companies in Nigeria

The following key elements appear from the assessment of milk collection in Nigeria :

On milk collection by multinational dairy companies :

- FrieslandCampina is the only multinational company collecting fresh milk for its own processing in Nigeria, and is also currently the biggest regular milk collector with 6,000L/day (Up to almost 20,000L at the peak production time at the end of the rainy season) in Oyo State in the West of Nigeria.
- Arla is currently collecting about 3,000L/day through the federation of producer organisations MILCOPAL in Kaduna State in the North of the country.
- PZ Cussons and Promasidor have tried to collect milk⁸², either in Lagos State near their processing facilities or from major commercial farms in Kwara State, but there is known milk collection at the moment.

Challenges in milk production and collection met by vertically integrated dairy farms:

Among the 15 most visible and important vertically integrated dairy farms in Nigeria (Nyyia, Integrated Dairies, Nagari Integrated Dairy, L&Z Farms, 4 of the 13 Shonga Farms, Maizube, Sabore, Idi, Admiral Farm, Majestik, etc.), ongoing problems related to milk production and processing have been reported. A number of them are currently not producing nor processing fresh milk.

Important existing capacity to collect:

It appears that no actor involved in the formal collection of milk in Nigeria has reached their full capacity of milk cooling, storage and processing. In many cases on vertically integrated dairy farms, the available collection and processing equipment even appears oversized compared to the size and production of the herd. Milk collection is limited by failures to collect milk in the right quantity and quality from neighbouring pastoral communities, and by low milk production on the farms.

Low collection of milk produced by pastoralists:

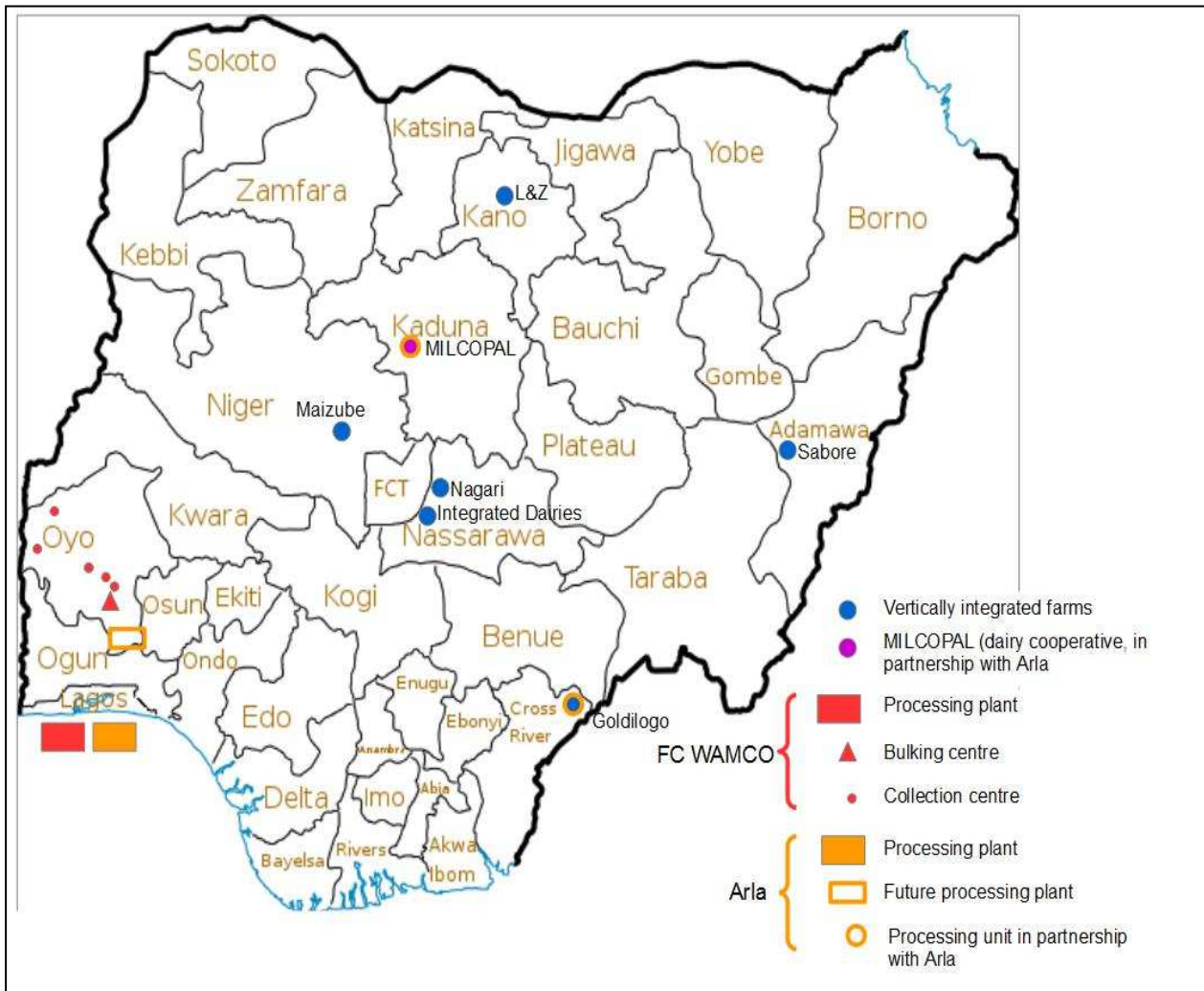
- MILCOPAL is a federation of pastoralist milk producer associations and operates milk collection centres and a factory in Kaduna State in the North of Nigeria. MILCOPAL currently collects up to 3,000L/day from pastoralist communities⁸³, while it has a capacity to process 18,000L/day. Milk collection is therefore suboptimal given the facilities available and the number of producers that could potentially supply the cooperative⁸⁴.

82 See Promasidor : <http://www.brandcrunch.com.ng/2013/10/15/promasidor-partners-rosedale-farms-for-dairy-production/> and <https://theeagleonline.com.ng/promasidor-partners-rosedale-farms-for-dairy-production/>, and PZ Cussons-Nutricima : <http://thenationonline.net/shonga-farms-doing-just-fine/> and <https://guardian.ng/sunday-magazine/shonga-farm-great-idea-fraught-with-doubts/>

83 IFDC, *ibid.*, and discussions with dairy stakeholders in Nigeria in July 2018.

84 Annatte, I., Gana, M., Ogundipe, G.A.T., Dafwang, I.I., Rural dairy cooperative development systems: a case study of Kaduna pilot dairy project in Nigeria, Proceedings of the 11th Symposium of the International Society for

- A number of dairy and multinational dairy processors have attempted to collect milk from neighbouring pastoralist farmers, either because they do not produce fresh milk themselves, or in order to complete their own production, given the size of their processing facilities. In the case of vertically integrated dairy farms, milk was either brought to the farm by producers or transporters from the pastoral communities, or collected by the dairy farm near the pastoral communities.
- Apart from FrieslandCampina, MILCOPAL for Arla, and L&Z Farms and Nagari Integrated Dairy, all of the other attempts have not lasted in time.



Milk collection costs

- Milk collection costs are estimated at around NGN20/L (CFA Franc 30/L or Euro 0.046/L) by FrieslandCampina WAMCO. Arla has the same target of collection cost for their future milk collection.
- L&Z Farms reported a much higher collection cost, at NGN80/L (CFA Franc 120/L or Euro 0.184/L) . This is probably due to the lower volume collected (2,000-3,000L/day on 4 milk collection centres, against the double volume for FrieslandCampina).

Key challenges in milk collection in Nigeria

Milk collection is, like in many other countries, a key bottleneck for the development of a dairy processing industry based on local milk production. Local fresh milk is considered by the dairy industry as expensive, of low quality and irregular in delivery and cannot therefore be the base for semi-industrial or industrial dairy production, especially with the availability of cheap milk powder throughout the country. The main challenges mentioned by dairy practitioners are the following:

- The lack of infrastructure (especially power supply) to operate cold supply chains.
- Poor road infrastructure making milk transportation costly and difficult, especially during the rainy season.
- The low and unpredictable quantity of milk collected from farmers (due to low production or roadside selling of the milk)
- The low quality of milk in terms of bacterial content (due to milking conditions and conditions of transportation up to the collection point, and sometimes manipulation of the quality of milk by producers) and the constraints it brings on processing.
- As a consequence of high bacterial content of the milk collected, short shelf-life of locally produced dairy products.
- The absence of standard screening systems for the quality of milk.
- The high cost of fresh milk (Often around NGN150-200 per litre or CFA Franc 225-300/L or Euro 0.354-0.46/L), especially compared to the cost and convenience of imported milk powder.
- The high costs and long time of collection when collection needs to be done by the dairy farm or company.

Current and future milk collection mechanisms of 3 major milk collectors:

FrieslandCampina WAMCO

Current milk collection in Oyo State

- WAMCO collects milk generally sold by pastoral women – often through male transporters from their communities – in their 5 milk collection centres (located in Fasola, Maya, Alaga, Iseyin and Saki) in Oyo State. The collection centres are located close to clusters of middle-scale producers with around 50 cows, who have become settled or semi-settled⁸⁵. The maximum distance from a farm to the milk collection centre is 30km. Milk is brought by farmers (usually by motorbikes) in aluminium cans provided by WAMCO. Each collection centre has a capacity of 12,000L/day.
- From the collection centres, WAMCO ensures the quality control, cooling and transportation of the milk towards a bulking centre located in Iseyin⁸⁶, Oyo State. The milk is again tested for quality before being bulked. The bulked milk is then transported by refrigerated trucks to the factory located 3-5 hours away in Lagos, tested in a more detailed way, and mixed with milk recombined from milk powder to make evaporated milk (under the Peak brand).
- The milk price is usually defined for one year, and evolves in relation to the inflation. It is currently at NGN120/L (CFA Franc 180/L or Euro 0.276/L). The cooling and transportation of milk from the milk collection centres to the plant in Lagos is estimated at around NGN20/L (CFA Franc 30/L or Euro 0.046/L). In the future, FC WAMCO hopes to reduce some of the costs in fuel (to operate generators in the milk collection centres) by developing solar power solutions.
- One key issue in milk collection lies in the quality of milk, that is still not satisfactory for FC WAMCO, despite important progress. Bacterial counts in the milk have fallen from 5 million per litre in 2011 to under 500,000/L today, but are still far from European standards (lower than 100,000/L) and make it difficult to plan the production of UHT milk.
- WAMCO has started to organise pastoral women into cooperatives in areas around 2 milk

⁸⁵ Arla, Human rights assessment in Nigeria, 2015.

⁸⁶ <http://www.nta.ng/news/domestic/20171114-bagudu-explores-milk-production-value-chain-for-kebbi/>

collection centres, and will support them to develop crossbreeding of cows. Young farmers are also being supported to organise in cooperatives.

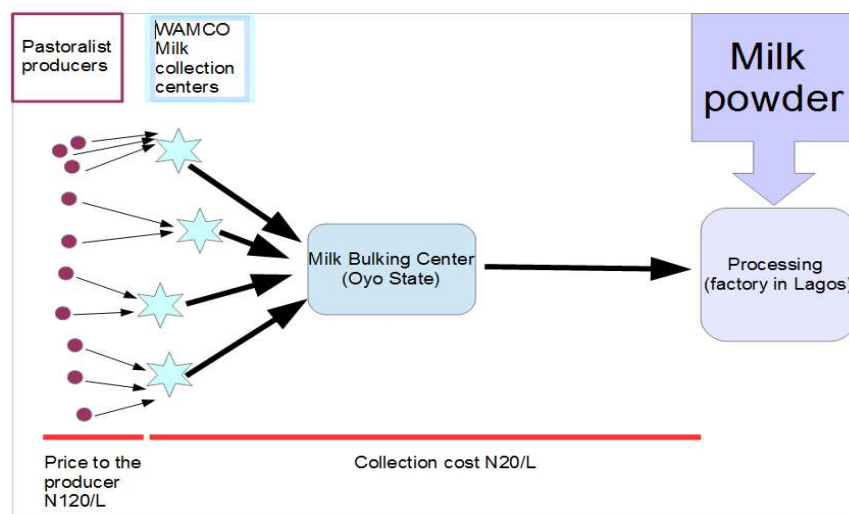


Diagram 1: Milk collection system of FC WAMCO in Nigeria

Future milk collection with smallholder dairy farms in Oyo State:

- Future targets in terms of milk collection are to increase milk production per cow (and aim at reaching 10L/day/cow with crossbreeds) and increase total milk collection in Oyo State with more milk collection centres, to reach the full capacity of the bulking centre in Iseyin (84,000 L/day). The bulking centre (84,000L per day) is still not fully used (6,000L collected daily, with peaks at 20,000L per day).
- A new programme started in 2016, with the support of the Dutch cooperation agency. It aims at developing smallholder settled dairy farms in Oyo State. The programme will start with 20 new farmers, with the hope to attract 500 Fulani pastoralists from the area. The project will start by creating 5 master farms of 5 to 10 cows that would operate as demonstration individual dairy farms equipped with cooling equipment, tractors and other equipment that will be available for 5 other dairy farmers clustered around each master farm. The master farms will therefore act as:
 - demonstration farms for pasture production, silage making, herd management, milk management, etc.
 - aggregation points for the milk from 4 other farmers around
 - points of storage for mutualised equipment for pasture production, feed making, etc.
 - Despite requests from other States (For example, the governor of Kebbi State visited FC WAMCO's facilities and plant in Lagos and Oyo states in November 2017)⁸⁷, FC WAMCO is not considering expansion of milk collection beyond Oyo State at the moment.

Arla

Current milk collection by Arla and partners

- Arla is starting to work on milk collection through partnerships with the federation of pastoral milk producers MILCOPAL in Kaduna State in the North of Nigeria, and with large-scale commercial farm Rosedale (one of the 13 farms set under Shonga Farms Holdings by white Zimbabwean farmers some years ago) in Kwara State in the West of Nigeria.
- 6 MCCs will be active by the end of 2018,
 - 1 in Kwara State at Rosedale Farm: Rosedale Farm has a herd of 700-750 Jersey cows, is

⁸⁷ <http://www.nta.ng/news/domestic/20171114-bagudu-explores-milk-production-value-chain-for-kebbi/>

- equipped with milking, cooling and processing equipment, and used to process their own dairy products before recently stopping milk production.
- 5 in Kaduna State with MILCOPAL.
- 3,000L/day should be collected in 2018, up to 5,000L/day at the end of the rainy season. Milk will be processed in the facilities of Rosedale Farm in Kwara and of MILCOPAL in Kaduna. As of July 2018, milk is collected in 2 MILCOPAL collection centres and pasteurised at the local level before transportation to the MILCOPAL plant in Kaduna. This milk is mixed with evaporated milk to make yoghurt that is not sold under Arla's branding.
- The expected milk intake in 2019 is about 10-15,000L/day, with a maximum of 20,000L/day at the end of the rainy season.

Future milk collection in Kaduna, Kwara and Oyo States.

- Arla is planning to collect milk in Kwara State (with Rosedale Farm), in Kaduna State (with MILCOPAL) and in Oyo State. 3 processing plants should operate in Ibadan (Oyo State), in Rosedale Farm (Kwara State) and in MILCOPAL Kaduna Dairy Plant (Kaduna State).
- Arla has been working on a business model for milk collection, with the goal to achieve the collection of 100 tonnes of milk/day within 5 years, and to collect milk that corresponds with international standards (Arla's usual standards for milk processing in Europe). There should then be 80 collection centres managed by Arla.
- According to Arla, such quantity and quality of milk will require control and management of water and feed for cows, and hence will require to settle the milking cows (Some cows can still be moved around by pastoralists). Land allocation is then a key issue, and it needs to be solved and secured both in the formal system and in the traditional local customary system of land management. Arla's estimates show that a daily milk yield of 4-5 kg per cow is needed for farmers to break even on costs and investment in a milking machine and cooling system.
- Arla's collection model will differ from FC WAMCO's one in that there will be 3 processing plants (In Kaduna, Oyo and Kwara States), no bulking centres, and milking (with milking machines) will not be done on the pastoralists' farm but by pastoralists directly in the milking parlours set up at the milk collection centres. Milk will then be transported in refrigerated trucks every day (every other day in case low quantities) to the processing plant.
- This design brings about the following characteristics, constraints and benefits :
 - There needs to be a critical mass of cows (100) and milk around before a milk collection point equipped with a milking parlour can be set up. This requires identifying villages with 100 cows to be milked.
 - One parlour could therefore cover one farmer (if he can cover the production needs), like in some peri-urban areas, or up to 20 of them.
 - The maximum recommended distance of grazing is 1km from the milking parlour. Farmers would indeed need to come and bring their cows up to the collection point to milk them.
 - Individual registration of cows would allow to bring cows from different farmers to the same parlour, allow for the individual monitoring of quantity and quality (visually) of milk production.
 - Testing of the quality of milk will take place at the level of the parlour, for each tank coming to the processing centre.
 - There is a possibility for producers to buy back milk at the price they sold it at the milk collection centre, if they want to avail of standard quality milk for their own usage (local processing). A service cost might have to be added for milking and cooling the milk.
 - A registration officer from Arla would manage and monitor the MCC, and control the milking operations.
 - Technical support (on milking practices, on feeding of milking cows, etc.) could be delivered to all farmers who come and bring their cows, without having to come and visit all farm locations.

- Offtake agreements and payments, with the deduction of support provided (Especially for feed).
- The price should be based on the usual Arla price (Based on the global market price of milk), taking into account the fat and protein content of milk (Which should be at the advantage of producers in Nigeria).
- The target transportation cost borne by Arla for picking up the milk from the milk collection centres to the plant is NGN20/L (CFA Franc 30/L or Euro 0.046/L). This cost will however highly depend on the ability to achieve the critical mass of milk for collection, the distance to dairy and the access infrastructure to the collection places.

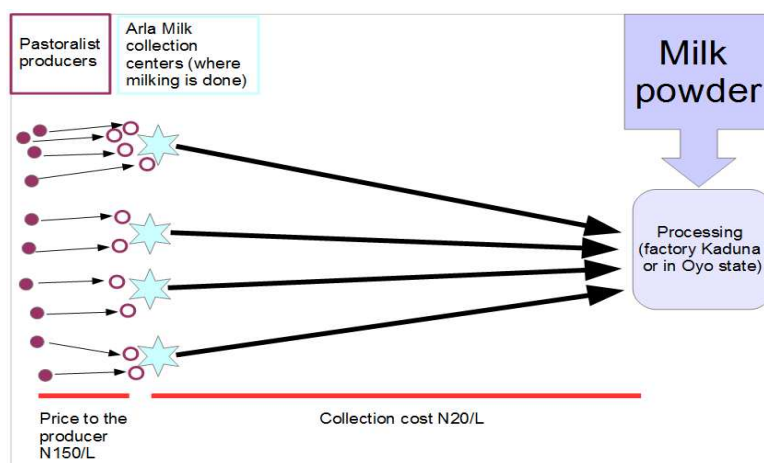


Diagram 2: Milk collection system of Arla in Nigeria

Plans for a pastoralists' settlement project in Kaduna State :

Apart from the existing collection centres of MILCOPAL Arla is currently working with MILCOPAL and the Kaduna State government on a dairy settlement for pastoralists :

- The plan is to work with around 1,000 pastoral families that would settle in a ranching zone of 6,000ha. This should allow for the raising of 12,000 cows. Some 200-300 new farmers (not pastoralists) would also come in the ranching zone.
- Total investment for the project is close to NGN170 billion (CFA Franc 255 billion or Euro 391 million), including for water and power supply, cattle sheds, calf pens, fencing, milking parlours, veterinary clinic, schools, health centres, houses), with commitment from the government to invest in public facilities.
- Daily intake of milk will reach 80,000L/day by the end of the 2nd year, and could potentially reach 160,000L/day in 10 years.
- It is planned that 50 milking parlours/collection centres could be built in the project (With 2 clusters of 10 farmers grouped around each of them), that would come in addition to the 80 milk collection centres expected by Arla to reach their 5-year 100,000L/day target mentioned above.
- With an average payment of milk at NGN150/L (CFA Franc 225/L or Euro 0.345/L), and productivity per cow to increase from less than 3L/day to more than 9 in a few years and 14L/day in 9 years, a strong increase in income for pastoralists and dairy producers is expected (Income per cow multiplied from around NGN40,000/CFA Franc 60,000 to more than NGN400,000/CFA Franc 600,000)
- In Zaria in Kaduna State, Arla would work with the National Animal Production Research Institute (NAPRI) to upgrade their existing collecting and cooling facilities.

L&Z Farms in Kano State

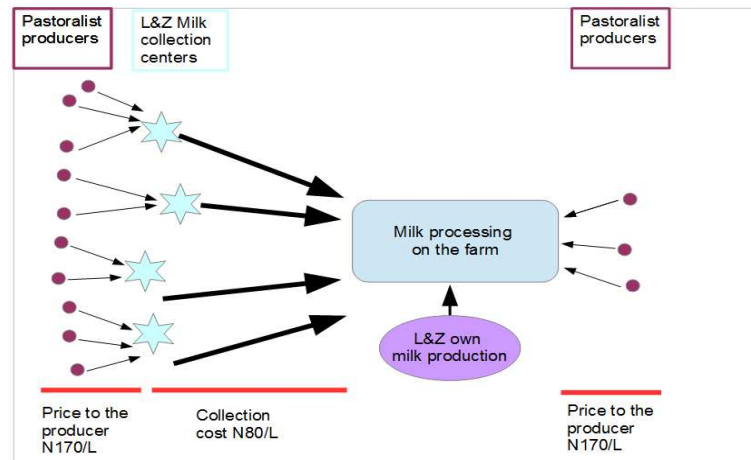


Diagram 3: Milk collection system of L&Z Farms in Nigeria

- On top of its own milk production (The farm's own cows produce 300L/day), L&Z Farms collects 2,000 to 3,000 litres of milk per day, mostly from pastoralist farmers, and a few specialised dairy farmers .
- Milk is collected in 4 Milk Collection Centres managed by L&Z Farms. Farmers come from less than 2km away around the milk collection centres. They bring milk by motorcycle (Using milk cans supported by international development partners). Milk is then transported by L&Z Farms from the 4 milk collection centres directly to L&Z Farms, without the use of a bulking centre.
- Some pastoralist farmers bring their milk directly to L&Z Farms, but there is a need to check thoroughly the quality of the milk that is brought.
- Milk is paid NGN170/L (CFA Franc 255/L or Euro 0.391/L) to the farmers. Collection and transportation costs for L&Z Farms are estimated at around NGN80/L (CFA Franc 120/L or Euro 0.184/L). The 4 Milk Collection Centres are equipped with a generator for power, which contributes to the high collection costs.
- In general, the pastoralist farmers supplying L&Z Farms are semi-settled or settled. Some of them are able to own a significant number of cows and buy land, where they can keep cows permanently.

| Dairy company | State | Processing capacity (L/Day) | Milk Powder Use of fresh milk in processing Milk collection from neighbouring farmers | Use of milk powder for processing |
|---------------|------------------|-----------------------------|--|-----------------------------------|
| FC WAMCO | Oyo | | Average current milk collection 6,000L/day, up to 15-17,000L/day during rainy season. Collection from 3,500 pastoral farmers. Estimated at 3% of total processing volume. 10% fresh milk incorporated in evaporated milk. (Attempt to incorporate up to 40% fresh milk in future yoghurt) 5 milk collection centers (12,000L/day capacity each) in Oyo State. Milk Bulking Center capacity 84,000L/day. (plans to collect from new dairy farmers) (Medium-term goal to reach bulking center capacity in milk collection 84,000L/day) | Yes |
| Arla | Kaduna Kwara Oyo | | 2 milk collection centers managed by milk producer cooperative MILCOPAL in Kaduna State, where milk is pasteurized and incorporated with evaporated milk to make yoghurt that is not branded Arla. In 2018 average current milk collection 3,000L/day, with 5,000L/day expected at the end of the rainy season. | Yes |

| Farm | State | Processing capacity (L/Day) | Milk production capacity (L/Day) | Milk collection from farmers | Use of milk powder for processing |
|-------------------------|----------|--|---|---|-----------------------------------|
| Integrated Dairies | Nasarawa | 5,000-10,000 | 3,000-4,000 | | Yes |
| Nagari Integrated Dairy | Nasarawa | 3,000-6,000 | 1,500-2,000 | Some | Yes |
| Majestik Farm | Jigawa | 3,000-5,000 | Currently less than 100L/day | | No |
| L&Z | Kano | 2,000-3,000 | 300 | More than 2,000L/day collected from pastoralist communities around the farm | No |
| Maizube Farm | Niger | 3,000-5,000 | 1,200-1,500 | | No |
| Sabore Farm | Adamawa | 3,000-5,000 | 1,200-1,500 | | No |
| Shonga Farms (13 farms) | Kwara | 50,000L/day but no processing at the moment. | 2,000 cows used to produce milk on 4 farms. (Rosedale Farm's herd of 700-750 milking cows might start producing again in partnership with Arla) | | No |
| Niyya Farm | Kaduna | 5,000-8,000 | Uncertainty on availability of milking cows at the moment | | Yes |
| Jamil Farm | Kaduna | 10,000-20,000 | Farm closed after the death of its owner. | | |
| FarmFresh | Plateau | 10,000 | There used to be a production of 5,000L/day | Milk collection was attempted but failed (due to issues with quantity and quality of the milk collected). | Yes |

| Institution/organization | State | Processing capacity (L/Day) | Milk production capacity (L/Day) | Milk collection from farmers | Use of milk powder for processing |
|--------------------------|--------|-----------------------------|----------------------------------|------------------------------|-----------------------------------|
| MILCOPAL | Kaduna | 18,000 | 3,000L/day | 3,000L/day | Yes |

Table 6: Non exhaustive inventory of milk collection by dairy companies and vertically integrated dairy farms in Nigeria in 2018 (in parenthesis, future plans for milk collection).

Milk processing in Nigeria

Actors of milk processing in Nigeria :

Dairy processing in Nigeria mostly revolves around the repacking of imported milk powder, the use of milk powder to make evaporated milk, and the making of yoghurt (mostly based on milk powder). There are more than 80 indigenous and foreign importers and manufacturers that are involved in the processing and trading of dairy in the formal market channels in Nigeria⁸⁸:

- There are few large, well equipped dairy processors in the country with throughput of well over 50,000 -1million litres of milk equivalent per day⁸⁹. Most of these dairy giants are multinational companies, and they control the great majority of the dairy market in Nigeria⁹⁰. Among them are dairy companies (FrieslandCampina WAMCO, Arla's joint venture, Ornu the Irish Dairy Board, Ice cream leader FAN Milk that is owned by Danone, Chellarams that repackages milk powder for Fonterra, Oldenburger, Regal Foods, etc.), and some companies that are present on a wider range of consumption goods (Nestlé, PZ Cussons that owns Nutricima, CHI that also makes juice drinks, Promasidor that also makes beverages and cereal products). Most factories are located in and around Lagos, Ogun and Oyo states in the South-West of Nigeria, mainly due to the high population density and access to the country's largest port⁹¹.
- A number of medium-sized dairy plants mostly use powder milk, and sometimes fresh milk, to process around 1,000-5,000 litres milk equivalent per day, especially for yoghurt⁹².
- Numerous small scale processing outlets with a capacity of processing around 50 litres per day operate, especially in the North of Nigeria where most cattle are concentrated⁹³.
- As described above, more than a dozen of vertically integrated dairy farms settled in the North of Nigeria (Kaduna, Kano, Jigawa, Nasarawa, Adamawa, Plateau, Katsina States) process pasteurised milk, yoghurt and a few other dairy products, mostly based on milk powder.
- Specialised dairy farms are organized in the Commercial Dairy Ranchers' Association (CODARAN), presided by the owner of L&Z Farms, Mohammed D. Abubacar. CODARAN promotes a vision of the dairy sector that is based on the production, collection, and processing of milk from diverse isolated locations, in respect of hygiene standards. The association also seeks to improve the market share of local dairies through strategic partnerships.

Fresh milk processing in Nigeria

- Fresh milk that enters the formal dairy value chain channels in Nigeria is processed in only a small range of products:
 - Pasteurised milk or yoghurt (By MILCOPAL, L&Z Farms, other vertically integrated dairy farms that would collect fresh milk) ;
 - Evaporated milk: FC WAMCO currently combines 10% fresh milk with imported whole milk powder in the making of Peak full cream evaporated milk.
- Fresh milk is not used for making milk powder (due to the low quantities of milk produced, the huge investments required to make milk powder, the need for dairy companies in Europe, USA and New Zealand to export their milk powder to West Africa and Nigeria in particular), nor ice

88 Arla, *ibid*.

89 Ayok, C., *ibid*.

90 Arla, *ibid*.

91 *Ibid*.

92 Arla, *ibid*.; Ayok, C., *ibid*.

93 Ayok, C., *ibid*.

- cream nor UHT milk (due to hard requirements in terms of milk bacterial content).
- In the coming 5 years, when milk collection increases to more than 30 million litres per year for FC WAMCO and Arla, the two companies will develop new uses for fresh milk processing, focusing on incorporation in evaporated milk, liquid yoghurt and possibly UHT milk:
 - FC WAMCO plans to keep incorporating fresh milk in the making of evaporated milk but also to open a yoghurt processing line that would use raw milk (Up to 40%), with milk collection relying on the specialised dairy farms to be developed in their new dairy development programme in Oyo State.
 - Arla doesn't plan to use fresh milk to be added in the mix to prepare evaporated milk, but rather for 100% fresh milk products (yoghurt and UHT milk) that would be branded under local brands, not under Arla.
 - One key challenge for the development of the fresh milk value chain in Nigeria lies in the fact that there is no segment of the current market where milk powder, which is much cheaper than fresh milk, is not present:
 - Some pastoralist women processing raw milk to make traditional products that are sold in the neighbouring communities are now using milk powder to increase the volume of dairy they can process and sell, and to cope with the lack of fresh milk availability during the dry season.
 - Apart from less than a handful vertically integrated dairy farms, there is no dairy processor in the country that does not use milk powder in processing dairy products.
 - Fresh milk, the only segment of the dairy market that cannot by definition be reached by milk powder, is not consumed in Nigeria, apart from in the informal channels where individuals order milk from pastoralist producers and go and fetch it.

Challenges face by the dairy industry to develop fresh milk processing in Nigeria⁹⁴:

- Very low purchasing power of the majority of consumers in the country : most consumers choose their dairy products based on the price (hence milk powder or evaporated milk), and fresh milk only comes in premium products.
- Even though there is interest in the nutritional and taste qualities of fresh milk, there is also a growing interest of consumers for guarantees on traceability and safety, and general mistrust on the safety of local fresh milk.
- The products made from fresh milk, mostly yoghurt, have a limited shelf-life, and cannot be widely distributed as they require to be maintained in a cold chain.
- The acquisition of cooling and processing equipment for dairy processing is expensive (25% tariff on the importation of equipment, with constraining procedures at the ministry of agriculture or the ministry of industry to get waivers on tariffs), and current fresh milk collection volumes do not guarantee an optimal use of the equipment.

⁹⁴ Interviews with L&Z Farms and PZ Cussons, July 2018.

Dairy imports in Nigeria

Given that its dairy market relies heavily on milk powder and evaporated milk (made in Nigeria with imported milk powder), Nigeria is a major importer of whole milk powder and fat-filled milk powder. Nigeria is considered as the largest importer of full-fat milk in Africa⁹⁵.

Dairy supply gap in Nigeria

Depending on the estimates of local milk production in Nigeria and overall demand for dairy in the country, estimates of the supply gap that is filled by dairy imports vary between 600,000 tonnes of milk equivalent per year and 1,400,000 tonnes of milk equivalent per year:

| Source | Annatte ⁹⁶ | Dr. Celestine Ayok ⁹⁷ | Arla (referring to Augusto & Co.) | Dairy Chain ⁹⁸ | FMARD (APAP 2016-2020) | FMARD at Abuja workshop | PWC | CODARAN |
|------------------------------------|-----------------------|----------------------------------|-----------------------------------|---------------------------|------------------------|-------------------------|-----------|-----------|
| Year of publication | 2012 | 2013 | 2013 | 2014 | 2016 | 2016 | 2017 | 2018 |
| Estimate in million tonnes of milk | 700,000 | 1,100,000 | 1,100,000 | 700,000 | 1,400,000 | 600,000 | 1,100,000 | 1,300,000 |

Table 7: Estimates of dairy demand-local supply gap in Nigeria

If we take into account two figures mentioned as reasonable earlier in the study (average FAO estimate of yearly milk production at around 550,000 tonnes, and estimated demand for milk at around 1,800,000 tonnes per year), the supply gap filled by dairy imports indeed gets close to 1,200,000 tonnes of milk equivalent per year.

Imports of dairy products in Nigeria

Quantity of imports

Nigeria's imports of dairy steadily increased between 2009 and 2014, with a sharp decrease since the economic recession struck the country in 2015. Experts foresee that the trend for the coming years is towards an increase of dairy imports as soon as Nigeria's economy gets back on its 5-6% growth rate path. Nigeria imports mostly whole milk powder (Almost 72,000 tonnes per year in 2011-2016) and skimmed milk powder (Almost 35,000 tonnes per year in 2011-16) and evaporated milk (More than 19,000 tonnes per year in 2011-16)

95 « Kerrygold is opening a new factory... in Nigeria », 2 December 2015 : <http://www.thejournal.ie/kerrygold-nigeria-powdered-milk-2478211-Dec2015/>

96 Annatte, I. et al, *ibid*

97 Ayok, C., *ibid*.

98 <http://www.businessdayonline.com/morecompanies/real-sector/article/frieslandcampina-wamco-aggressive-expansion-close-700m-litre-milk-gap/>

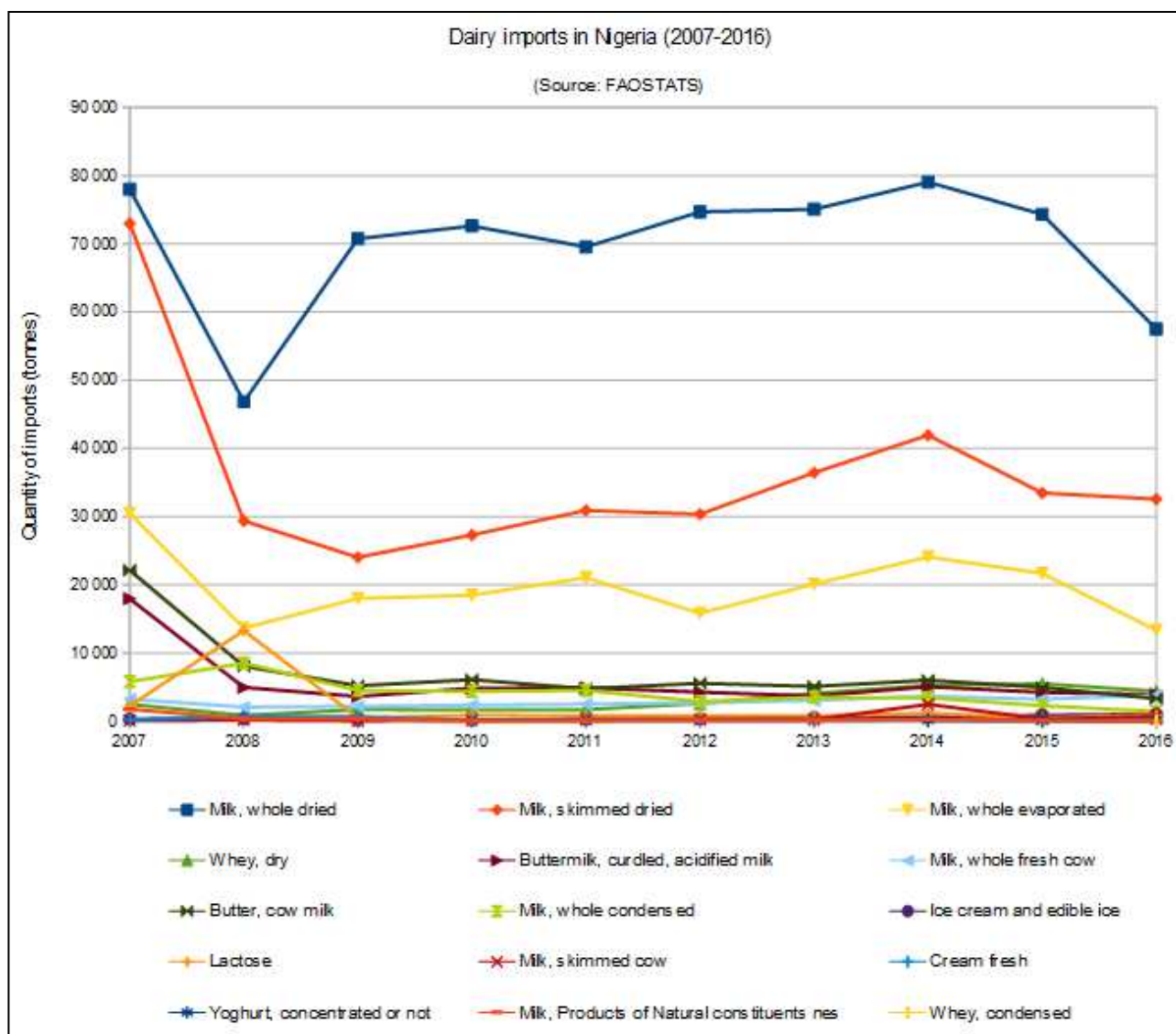


Diagram 4: Dairy imports in Nigeria, 2007-2016, in tones (Source : FAOSTATS)

Besides, a significant amount of fat-filled milk powder is imported in Nigeria. There is no data available on the quantities of fat-filled milk powder imported, but all brands present on the milk powder market in Nigeria offer a fat-filled version of milk powder besides whole milk powder for almost all sizes of packaging, and fat-filled milk powder is used in the making of evaporated milk and in a number of flavoured drinks and liquid yoghurt. Given that milk powder, evaporated milk, flavoured drinks and liquid yoghurts are the biggest segments of the dairy market in Nigeria, that products made with fat-filled milk powder are cheaper than those made with whole milk powder, and that stakeholders of the market consider that most dairy consumers in Nigeria are poor and make purchase choices based on price, it is safe to assume that imports of fat-filled milk powder might amount to volumes higher than those of skimmed milk powder (35,000 tonnes per year in 2011-2016), and possibly close to the level of imports of whole milk powder (More than 70,000 tonnes per year in 2011-2016).

The Irish dairy board Ornu reported for example that in 2014 Nigeria imported 166,000 tonnes of

milk powder⁹⁹. Based on FAO estimates, about 79,000 tonnes of whole milk powder were imported in Nigeria that year, and about 41,000 tonnes of skimmed milk powder. This would suggest that 40,000 tonnes of fat-filled milk powder could have been imported in Nigeria on that year.

A very gross estimate using a 1 to 8 factor for milk powder to milk and a 1 to 2 factor¹⁰⁰ for evaporated milk to milk suggests that the average imports of whole milk powder + skimmed milk powder + evaporated milk in Nigeria in 2011-2016 corresponds with about 880,000 tonnes of milk equivalent. With the assumption that imports of fat-filled milk powder are equivalent in weight to those of skimmed milk powder, the total of imports of milk powder and evaporated milk corresponds to about 1,100,000 tonnes of milk equivalent. This gross estimate, that doesn't take into account imports of UHT milk, yoghurt, cheese, butter, etc., seems to confirm the assumption that dairy imports in Nigeria are higher than 1,000,000 tonnes of milk equivalent per year.

Value of dairy imports:

- In 2011-2016, Nigeria spent an average of close to US\$ 536.9 million (More than NGN191 billion or CFA Franc 440 billion) on the importation of dairy products annually¹⁰¹, not taking into account imports of fat-filled milk powder. Imports peaked at US\$ 727.5 million in 2014 (Almost NGN260 billion or CFA Franc 390 billion) before the country was hit by recession. Data on the value of imports of fat-filled milk powder imports are only available for 2015-16: Nigeria imported for close to US\$ 125 million (NGN44.6 billion or CFA Franc 66.9 billion) of fat-filled milk powder each year in 2015-16¹⁰².
- A number of sources mention an estimate of more than US\$ 600 million (NGN214 billion or CFA Franc 321 billion) of dairy imports per year¹⁰³, but this is much lower the US\$ 1.3 billion figure (NGN464 billion or CFA Franc 696 billion) recently mentioned by some dairy stakeholders (Commercial Dairy Ranching Association of Nigeria, Direction of Animal Husbandry of the Ministry of Agriculture and Rural Development, Ministry of Trade, Industry and Investment) in Nigeria¹⁰⁴.

Origin

- Dairy products are mostly imported from New Zealand, the European Union (Netherlands, Germany, Belgium, Denmark, France) and Australia, with New Zealand recently taking the lead in imports of milk powder, while most fat-filled milk powder imports come for the European Union (Mostly Ireland)¹⁰⁵.
- Nigeria is the single largest market for EU exports of fat filled milk powder taking over 10% of EU exports in this product category in 2015¹⁰⁶. In 2017, 31% of fat-filled milk powder exported by the European Union were traded in West African markets, with Nigeria, the main destination in the region, taking more than 28% of EU exports to West Africa¹⁰⁷.

99 <http://www.thejournal.ie/kerrygold-nigeria-powdered-milk-2478211-Dec2015/>

100 Factors that correspond with the indications provided by milk powder and evaporated milk brands on their packs and cans, based on observations made in Nigeria in July 2018.

101 Calculations by the author based on FAOSTAT.

102 Calculations by the author based on Trademap.

103 See Ornuo on 2014 imports : <http://www.thejournal.ie/kerrygold-nigeria-powdered-milk-2478211-Dec2015/> , elements from the presentation of the National Livestock Transformation Plan by the Federal Government in May 2018,

104 See CODARAN, Key policy thrusts for the dairy sector, 2018; <http://insidebusinessonline.com/index.php/2017/06/09/oyo-partners-dangote-group-rice-wamco-dairy/> ; <https://beverageindustrynews.com.ng/index.php/2018/03/08/fg-sets-up-committee-to-create-policy-framework-to-boost-dairy-industry/>; <https://www.dailytrust.com.ng/nigeria-spends-n469bn-on-dairy-products-imports-yearly.html>

105 Based on data from Trademap.

106 <http://epamonitoring.net/growth-in-eu-dairy-exports-overhangs-acp-dairy-sector-development/>

107 <http://epamonitoring.net/strong-expansion-of-eu-fat-filled-milk-powder-exports-to-west-african-markets->

- Nigeria is also one of the top 4 importers of European Union's whole milk powder (With Algeria, Oman and China)¹⁰⁸.

Use

- As explained above, imported milk powder is the main input of dairy processing in Nigeria, and is used in all segments of the dairy sector apart from fresh milk and UHT milk (Apart from CHI, all other UHT brands sold in Nigeria correspond with milk produced and packed in Germany and to a lesser extent in Belgium)¹⁰⁹. Milk powder is sold as milk powder in small sachets, and used for infant formula or reconstituting evaporated milk, yoghurt, flavoured drinks, ice cream, etc.
- In the past 10 years, Nigeria has increased its exports of dairy products, from US\$78,000 (NGN27.9 million or CFA Franc 41.8 million) in 2007 to more than US\$ 2.5 million per year (NGN893 million or CFA Franc 1.34 billion) throughout 2011-2014¹¹⁰. Dairy exports decreased to less than US\$ 1.5 million (NGN536 million or CFA Franc 804 million) in 2015 and about US\$ 1 million (NGN357 million or CFA Franc 536 million) in 2016, probably due to the economic crisis in the country. Nigeria's dairy exports consist first and foremost in whole milk powder (More than 80% of the value of annual dairy exports since 2017, apart from 2016). The range of dairy products exported by Nigeria has also increased, covering now almost all of the dairy product categories that are imported.
- However, it is considered by dairy manufacturing practitioners in Nigeria that the dairy industry will not particularly aim at exporting dairy products to the West African region, given the transportation constraints and costs, be it by shipping or by road. Besides, the cost of importing milk powder into Nigeria is not considered as lower than the cost of importing the same milk powder through another coastal West African country. It is therefore more relevant for coastal countries to import dairy products directly from Europe rather than have them transported from another West African country. In large-size countries, dairy companies can open repacking plants (Like in Ivory Coast or Ghana) and import milk powder to supply the national market, at less costs than importing sachets from Nigeria.

Milk powder and fresh milk.

- Milk powder covers the very large segment of the market corresponding with consumers looking for affordable dairy, possibly in small quantities, and outside of a cold chain that can be guaranteed 24 hours. However, milk powder is said to now reach beyond where fresh milk cannot be delivered with adequate cooling and safety, as it is part of Nigeria's consumption habits. Including in airports, restaurants and hotels where 24-hour power is guaranteed and cold chain is used for other food items, creamer/milk for coffee or tea is provided in milk powder of condensed milk¹¹¹. A food company that has been surveying the dairy market in Nigeria to start a business in Northern Nigeria also mentioned that milk powder is also bought in bulk by Nigerian dairies who collect fresh milk to process yoghurt, and by Fulani women who add it to fresh milk to increase the volume of their traditional processing¹¹². Milk powder has therefore a market penetration that goes beyond the limits of where local milk could technically be delivered fresh.

[resumes/](#)

108 https://ec.europa.eu/agriculture/sites/agriculture/files/market-observatory/milk/pdf/eu-extra-trade_en.pdf

109 Observation by the author in supermarkets in Nigeria in July 2018.

110 Calculations by the author based on FAOSTAT.

111 Observation by the author in Lagos and Abuja in July 2018, and discussions with dairy stakeholders in July 2018.

112 Interview with Salid Agriculture Nigeria Ltd. In July 2018.

- The competition between milk powder and fresh milk and its consequences in terms of prices can be seen on the liquid yoghurt market : based on observations made in July 2018 (and testimonies of dairy stakeholders), yoghurt made by vertically integrated dairy farms such as L&Z, Nagari, Nyia, etc. costs around NGN1,000/L (CFA Franc 1,500/L or Euro 2.3/L), while competing yoghurt made by large dairy processors such as PZ Cussons, CHI, etc., offer yoghurt at around NGN500/L (CFA Franc 750/L or Euro 1.15/L). The difference in price can be explained by the size and operating costs of the 2 categories of actors (processing farms vs. beverage industries), but also partly by the fact that fresh milk is a more expensive input than milk powder.
- For dairy processors making yoghurt, high quality medium heat full cream powder from New Zealand, Ireland or Denmark costs around NGN26,000–32,000 per bag of 25kg (CFA Franc 39,000-48,000 or Euro 59.8-73.6), or NGN104-128 per litre of yoghurt with 10% mixing ratio (CFA Franc 156-192/L or Euro 0.239-0.294), against a cost of NGN150-200 per litre of fresh milk (CFA Franc 225-300/L or Euro 0.345-0.460/L), without taking costs of milk collection and issues related to milk quality into account¹¹³.
- As of September 2017, imported milk was considered 10% cheaper than locally produced milk (Before the 2016 naira currency depreciation in 2016, imports were over 75% cheaper than local milk). The price competitiveness of fat-filled powder milk is even greater, as it is generally said to be 30% cheaper than whole milk powder.
- The consequences of cheap milk powder availability pointed at by local stakeholders are the following :
 - Lack of incentive to invest in local milk production, collection and processing for investors and dairy manufacturers.
 - Exposure of the dairy industry to foreign exchange risks, by relying on milk powder imports.
 - Comparatively higher production costs for integrated dairy processors who have invested in local production strategies, compared to their competitors.
 - Higher raw material costs for local integrated dairy processors leading to
 - a sharp reduction in profit margins, as integrated processors are unable to transfer higher costs to their finished dairy products ;
 - or a loss in competitiveness and market share versus imported powder milk processors if costs are translated to higher prices.

Public policies related to the cost of dairy imports :

- The low cost of milk powder in Nigeria, along its convenience of use and storage in the absence of permanent power supply, is considered a key constraint for the development of local dairy processing and distribution by a number of local dairy processors and commercial farmers in Nigeria¹¹⁴.
- However, in October 2016, the Federal Government of Nigeria approved the implementation of the ECOWAS 2015-2019 Common External Tariff and a new fiscal policy which reduced tariffs on imported dairy products from 10% to 5%¹¹⁵. In February and March 2018, along with the Senate of Nigeria, local producers and dairy actors opposed this measure as contrary to their recommendations, and pointed at the negative impact it will have on the development of the

113 Interviews with a dairy expert and dairy processing farm manager in July 2018.

114 Interviews with L&Z Farms and with a dairy expert and dairy processing farm manager in July 2018.

115 Sahel Capital Partners, Adverse implications of the reduction in tariffs on imported dairy Products to the local Nigerian dairy Industry, Presentation to the Minister of Trade, Industry and Investment, 2018; « Senate asks FG to suspend reduction of import duty on powdered milk », 14 February 2018:

<https://www.businessdayonline.com/news/article/senate-asks-fg-suspend-reduction-import-duty-powdered-milk/>

local dairy sector¹¹⁶.

Recommendations by local stakeholders with regards tariffs on milk powder imports¹¹⁷ :

- Take action to increase milk production and collection in Nigeria, to support investors and manufacturers who resort to local milk processing, and gradually increase the cost of milk powder, through higher tariffs and/or levies.
- Retain the existing 5% import duty on full cream and skimmed powder milk only, while 15% duty be imposed on vegetable fat filled powdered milk.
- In addition to the existing tariffs mentioned above, a 15% Dairy Development Levy on all imported solid dairy products including powder milk, cheese, and butter.
- Impose a 100% duty on Liquid milk and milk products which will discourage importation and accelerate backward integration.
- Use the additional customs financial resources to establish a National dairy development fund.
- After a certain duration, revert back to a 10% levy on powder milk.
- Introduce a mandatory 5-year import substitution programme to drive all importers of powder milk to introduce local milk in their processing: 10% in the 1st Year; 10% more in the second year; etc., up to 50% of local content is achieved at the end of 5 years. This requirement should drive investment in backward integration and local milk production and collection development.

116 « Local dairy producers groan over low tariff on imported milk », 16 February 2018:

<https://www.dailytrust.com.ng/local-dairy-producers-groan-over-low-tariff-on-imported-milk.html>

117 See CODARAN, Key policy thrusts for the dairy sector, 2018

Nigeria's dairy market

Value of the dairy market in Nigeria

There are various estimates of the total value of the dairy market in Nigeria :

- Over US\$ 2 billion (NGN714 billion or Franc CFA 1,072 billion) in 2013, according to a dairy expert and practitioner¹¹⁸ ;
- Total revenues of US\$1.481 billion in 2013 (NGN529 billion or CFA Franc 793 billion) and previsions of US\$1.836 billion (NGN656 billion or CFA Franc 984 billion) according to market studies¹¹⁹.
- US\$ 900 million in 2014 (NGN321 billion or CFA Franc 482 billion), and down to US\$ 660 million (NGN236 billion or CFA Franc 354 billion) and US\$ 695 million (NGN248 billion or CFA Franc 372 billion) in 2016 and 2017 respectively, according to the US government export support agency¹²⁰.
- The dairy market amounts to NGN100-300 billion (US\$280-840 million or CFA Franc 150-450 billion per year, according to the managing director of a multinational food company in Nigeria¹²¹.

There is however a consensus about the fact that the dairy market is very significant in the Nigerian economy, being considered as the second largest segment in the food and beverage industry in Nigeria¹²², and said to be contributing about 60 percent to the total food processing revenues¹²³.

Besides, a significant part of the estimated milk demand in Nigeria does not enter formal and measured marketing channels, and is therefore likely to not be included in the estimates of the value of the dairy market in the country. However, this large segment corresponding with roughly 90% of the around 550,000 tonnes of milk produced in Nigeria annually contribute to the livelihoods of hundreds of thousands of pastoral families and informal transporters and processors.

General trend : the dairy market is growing

- Apart from a punctual decline because of 2 years of economic recession and currency depreciation in 2016-17, in general the dairy market has been growing steadily in the past 10-15 years in Nigeria. The dairy market has grown at a compound annual growth rate of 8% between 2010 and 2014¹²⁴, and is expected to continue to grow at more than 7% per year¹²⁵, much faster than the population growth estimated at around 2,6% per year¹²⁶.
- The underlying consumer needs for health living and nutrition (especially for children) are still present. Besides, some of the middle class that re-emerged in Nigeria after 1999 and were then wiped out into poverty by the latest economic recession have kept their tastes and consumption

118 Ayok, C., *ibid.*

119 https://www.researchandmarkets.com/reports/2505349/dairy_in_nigeria

120 <https://www.export.gov/article?id=Nigeria-Agriculture>

121 Interview in Lagos, July 2018.

122 Ayok, C., *ibid.*

123 <https://www.export.gov/article?id=Nigeria-Agriculture>

124 Ayok, C., *ibid.*

125 <https://www.export.gov/article?id=Nigeria-Agriculture>

126 http://databank.worldbank.org/data/views/reports/reportwidget.aspx?Report_Name=CountryProfile&Id=b450fd57&tbar=y&dd=y&inf=n&zm=n&country=NGA

desires. Demand for dairy products, especially high value premium products such as flavoured drinks, yoghurt and ice cream, will therefore boom as soon as economic growth exceeds population growth in the country.

- Market studies foresee that all the main segments of the dairy market in Nigeria will continue growing in the coming years, especially yoghurt, flavoured drinks, ice cream.
- Demand for dairy in Nigeria will be driven in the next years by a conjunction of factors :
 - Population increase, from an estimated 180 million today to about 400 million in 2050¹²⁷. It is considered that 5 million children, prime users of dairy products, are born in Nigeria every year.
 - 45% of the people (around 75 million people) are less than 15 years old and therefore potentially in need of milk consumption.
 - Even though in February 2018 Nigeria overtook India with the most people living in extreme poverty Less than US\$1.90 per day or NGN679), and more than 2 thirds of the Nigerian population are poor¹²⁸, most Nigerian consumers participate in the dairy market.
 - Urbanisation (Almost half of the Nigerian population is urban¹²⁹, and urbanisation grows at more than 4% per year¹³⁰) brings changes in consumption patterns towards dairy products.
 - It is expected that after the economic recession of 2015-2016, economic growth will take off again at a higher rate than population increase and therefore contribute to the increase of income per capita and the development of a middle class that will consume premium dairy products.

Characteristics of the Nigerian dairy market

The dairy market as described below does not include infant formula products.

- The dairy market in Nigeria is extremely large, but dairy sales per consumer are very low : For a maximum market size of NGN300 billion for 180 million people, that amounts to less than NGN1,700/capita/year, or less than US\$5/capita/year.
- Milk powder represents more than 50% of the market value, then evaporated milk, and then yoghurt and flavoured drinks.
- Friesland Campina WAMCO, an affiliate of Royal Friesland Foods of Netherlands, is Nigeria's leading milk manufacturer. Its "Peak" premium brand is said to control around half of the dairy market share. FrieslandCampina and South African company Promasidor are said to jointly control 70% of the dairy sector's revenue¹³¹.
- However more than 70 local and imported brands are said to be present on the Nigerian dairy market, and more than 10 for the sole milk powder market¹³². South African company Promasidor, PZ Cussons, Nigerian CHI, FAN Milk, etc. are also significant in the dairy sector¹³³. UAC Foods and FAN Milk are major ice cream and yoghurt processors¹³⁴. Nestlé Nigeria Plc is also an important player in the dairy market.
- Ice cream is a small segment of the market (estimated in 2014 at about 10 million litres per year, with a value of approximately \$40 million per year, equivalent to NGN14.3 billion or CFA

127 Makun, H., *ibid.*

128 Makun, H., *ibid.*; and CODARAN, Strategic growth actions for Nigeria's commercial dairy sector, 2018.

129 <https://tradingeconomics.com/nigeria/urban-population-percent-of-total-wb-data.html>

130 http://databank.worldbank.org/data/views/reports/reportwidget.aspx?Report_Name=CountryProfile&Id=b450fd57&tbar=y&dd=y&inf=n&zm=n&country=NGA

131 Arla, *ibid.*

132 Own observations in July 2018 and Arla, *ibid.*

133 Arla, *ibid.*; https://www.researchandmarkets.com/reports/2505349/dairy_in_nigeria

134 Arla, *ibid.*; https://www.researchandmarkets.com/reports/2505349/dairy_in_nigeria

Franc 21.4 billion)¹³⁵), but there is a potential demand growth for it. The ice cream segment, like the segment of fresh yoghurt, is mostly constrained by price and the availability of cold chains, not by lack of potential consumer interest. The price of ice cream is equivalent to a full meal. Individual on the go lollies and sticks can be sold in the street, like by FAN Milk cart-vendors. Ice cream is only starting to be treated as a dessert, with some restaurants putting it on the menu and fast food brands and ice cream brands starting to build partnerships.

- UHT milk and cheese are only purchased by a small number of wealthy consumers.

Structure of the market in relation to consumers:

Out of 180 million people living in Nigeria, it is considered that:

- About 5 million people are extremely wealthy;
- Around 12 million people are wealthy;
- 40-50 million people manage to get by;
- 110-120 million people struggle to live.

The main dairy products sold in Nigeria (milk powder and evaporated milk, then liquid yoghurt) correspond with products that even the numerous poor consumers can afford in very small quantities and without access to power and a cooling system, by purchasing them from neighbourhood shops (see below).

Where consumption items (and probably dairy) are distributed and sold in Nigeria:

These gross estimates are based on discussions with the manager of a leading consumption goods – including dairy products – company in Nigeria:

- In supermarkets: Less than 5% of sales in Nigeria.
- In open markets: about 40-45% of the sales.
- In neighbourhood shops: about 40% of the sales
- Kiosks and table tops: about 10% of the sales.

In terms of dairy products, street kiosks and neighbourhood shops sell almost exclusively milk powder and evaporated milk.

Drivers of dairy market sales: The main constraint lies in the price of dairy products.

Since the 1990s and the introduction of small milk powder sachets in the market by new comer South African manufacturing company Promasidor, most dairy sales are done in individual portions of milk powder, evaporated milk, drinkable yoghurt or flavoured milk drink. The selling of 5 to 14-gramme milk powder sachets represents half of the sales in the country, 400-gramme packs about 40% of the sales, and family size packs (from 900g to 2,5kg) only about 10% of the sales. Sizes and grammage of sachets are decided based on the target price. That is why premium brands like Peak (FC WAMCO) will have smaller grammage to be able to offer competitive prices compared to cheaper brands.

Dairy purchases are determined by the possibilities and constraints of Nigerian consumers:

- Low purchasing power, and non-availability of money to purchase large quantities determine consumer behaviour towards dairy products and other food consumption products:
 - Many dairy consumers start their day with no money. Once they have gotten paid for some work, they can go the closest shop or street vendor to buy an individual portion of dairy product (milk powder or evaporated milk) for their coffee/tea, or to make a glass of milk for

135 Ayok, C., *ibid.*

- children.
- When they have some money available, consumers tend to buy the exact number of individual portions (of yoghurt, flavoured drink or milk powder) that corresponds with the number of children or people present at home.
- Maintaining control: In buying individual sachets, parents control exactly how much is consumed by each person, while family-size packs could lead to higher consumption/waste by member of the household.
- Poor cooling facilities at household level discourage bulk purchase of dairy products and favour the purchase of milk powder and evaporated milk.¹³⁶
- Large packs (1L-yoghurt bottles, family size packs of milk powder or cans of condensed milk) attract more wealthy consumers who can afford the purchase upfront, and then benefit from the economy of scale.

Perspectives on the dairy market sales in the future:

- The Nigerian market tends to leapfrog to the kind of products and consumption patterns that are booming now in economies such as Brazil or emerging Asian countries. With regards dairy, it can be expected that in the future with economic development, Nigerians will go more for products with added value and that are more palatable, like flavoured drinks, dairy-based snacks and ice cream, than for fresh milk.
- Nigerian consumers are aspirational. If they get the economic means for it, they want to get closer to their aspirations that are driven by middle class tastes. Dairy fits in this landscape as associated with providing good nutrients to children and looking for health benefits in food.
- However, the availability of power and road infrastructure will determine whether shops and consumers can store, and therefore sell and buy, value added products such as ice cream and yoghurts with live culture.

Market perspective on the development of dairy farming and production in Nigeria:

- According to the director of a major player¹³⁷ in the milk powder industry in Nigeria, there could potentially be a market demand for local dairy products in Nigeria. According to him, the dairy market in Nigeria is significantly determined by the existing constraints (purchasing power of consumers, absence of power in many homes and distribution points). The determining factors for demand for fresh milk therefore exist (interest in health benefits, children in need of milk proteins, attachment to milk in the North of Nigeria). As a consequence, if large quantities of local milk could be sold at affordable price for the majority of Nigerians, there would be a market for it.
- For local milk production to feed the national market the major constraints of power supply (to maintain the cold chain from the producer to the consumer's home) and transportation (road infrastructures and transportation costs and time) need to be lifted.
- For dairy production to be able to enter the manufacturing industry, there is a need to produce large quantities of milk. For dairy companies like Arla and FrieslandCampina, the cost of investing funds in developing dairy production locally is balanced by the fact they use milk powder produced by their company in Europe. For their competitors who import milk powder, there is no direct interest in purchasing fresh milk.
- Apart from in a few locations (Jos and Mambura Plateaux), Nigeria's climate does not offer any comparative advantage for dairy production compared to the areas (New Zealand, Western

136 Ayok, C., *ibid.*

137 Interview with the managing director of a major consumption goods company, including dairy, July 2018.

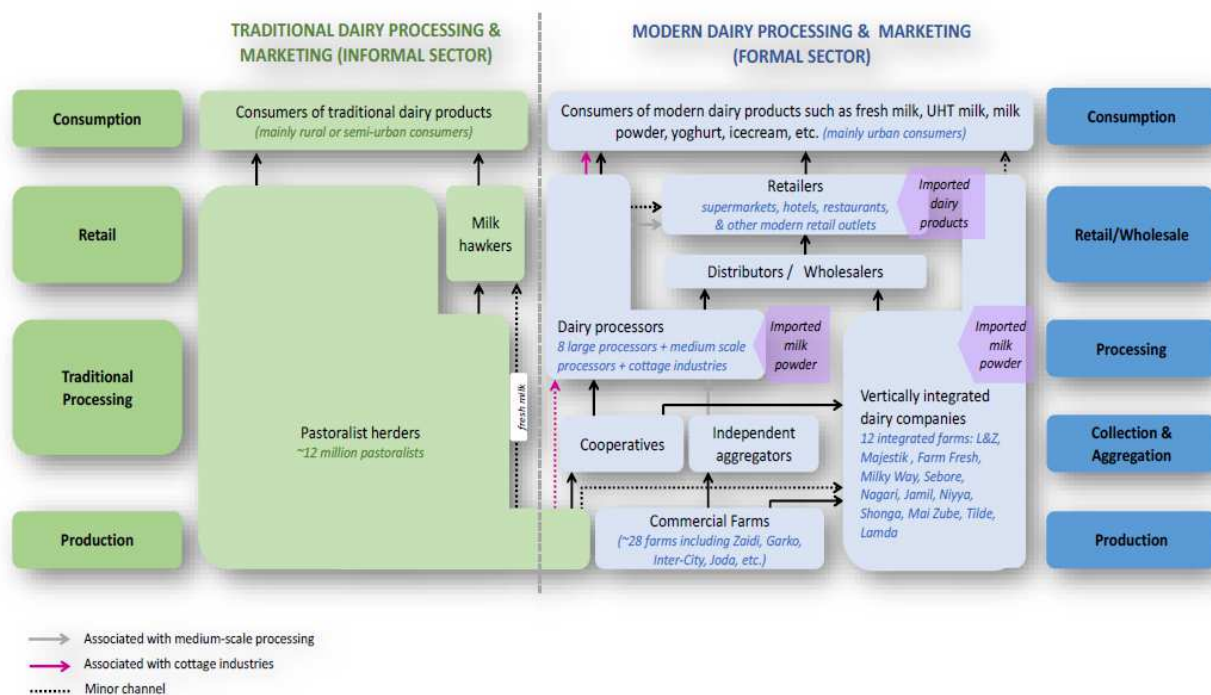
Europe, Australia) supplying milk powder to the market. Besides, in high-altitude plateaux, the climate comparative advantage is already being used with emerging fruit and vegetable productions: apple, strawberry, flowers, vegetables.

- Products based on fresh milk can currently only attract the upper segment of the market.
 - A number of vertically integrated dairy farms ((L&Z, Nagari, Integrated Dairies, Nyvia, Majestik, SAJ Foods, Spring Dairies, etc.) are present on this competitive section at more than NGN1,000/L (CFA Franc 1,500/L or Euro 2.3/L), and are in competition with yoghurt from milk powder or evaporated milk sold at NGN600/L (CFA Franc 900/L or Euro 1.38/L).
 - Imported UHT milk can be found at NGN600/L (CFA Franc 900/L or Euro 1.38/L), a price that seems hard to compete with for local milk given the current state of local production and processing. Local milk still must address the issue of bacterial content to be able to provide for UHT milk.
 - Products where the specific texture or taste of fresh milk comes out, such as in some ice creams or yoghurts,
 - Given the lack of cold chain in the country, it seems difficult to plan the development of sales industrially bottled fresh milk soon.

Dairy sector in Nigeria: A value chain synthesis

Identification of bottlenecks and challenges in the value chain

The formal dairy value chain in Nigeria is structured around the import and use of milk powder. Pastoral producers account for the vast majority of milk production in Nigeria, but take only a small part, in terms of volumes of equivalent of milk consumed by Nigerian consumers, in the formal market. Indeed, a full analysis of the dairy value chain in Nigeria requires not only to look at the various segments of the chain (production, collection, processing, etc.) but also to analyse the issues related to the linkages between the various segments and actors. Dr. Ayok made the following synthesis of the Nigeria dairy value chain in 2013 to show the linkages



between dairy actors in the informal and formal channels in Nigeria:

Diagram 5: Presentation of the dairy value chain in Nigeria according to Celestine Ayok, 2014¹³⁸.

We have attempted to summarise our findings regarding the constraints and strengths of the various segments of the local dairy value chain in Nigeria (static analysis, see table 7 below), therefore not looking at the milk powder-based dairy chain. Road infrastructure and powersupply appear as transversal issues that affect almost all levels of the local milk value chain.

138 Ayok, C., Dairy sector in Nigeria – An overview, slide presentation, 2014.

| | Milk Production | Milk collection | Milk Processing | Distribution and marketing |
|-----------------------|--|---|--|--|
| Key challenges | <p>High production costs of milk → high farmgate price of milk</p> <p>Inconsistency of grass & water supply</p> <p>High cost of feed inputs</p> <p>Challenges with animal health- poor feeding, disease incidence</p> <p>High bacterial content of milk</p> <p>Low volumes of milk produced</p> <p>Limited access to finance for nomadic herdsman</p> <p>Lack of skills in dairy herd management</p> <p>Tensions and politicisation around the future of pastoralism</p> <p>Cattle rustling and herder-farmer conflict hinder milk production</p> <p>Lack of influence of producers on policy making</p> | <p>Poor road infrastructure</p> <p>Lack of power supply to maintain the cold chain</p> <p>Access to cooling equipment</p> <p>High collection costs per litre of milk</p> <p>Inconsistency of milk quantity collected from farmers</p> <p>Impact of transportation on quality of the milk</p> <p>Absence of standard screening systems for the quality of milk</p> <p>Challenge in accessing funding for milk collection mechanisms</p> <p>Public authorities seem to consider that the private sector alone will set up the milk collection systems</p> | <p>Processing of fresh milk cannot compete on the main segments of the dairy market (milk powder and evaporated milk). Few segments are accessible.</p> <p>High cost of fresh milk compared to milk powder</p> <p>Milk powder more convenient for storage and guarantee on quality</p> <p>Low quality of fresh milk constrains processing possibilities</p> <p>Cost of equipment</p> <p>Challenge in accessing funding for processing activities</p> <p>Low milk volumes / oversized processing facilities</p> <p>Competition with many processors and attractive new products</p> | <p>Low purchasing power of consumers</p> <p>Poor road infrastructure constrains distribution</p> <p>Lack of power supply makes consumers favour evaporated milk, milk powder and yoghurt drinks</p> <p>Mistrust of some consumers in the safety of fresh milk in Nigeria</p> |
| Strengths | <p>High number of cattle</p> <p>Potential to increase production per cow</p> <p>Interest by decision makers in using milk production for development</p> <p>Many producers are willing to produce more milk if they can</p> | | <p>Yoghurt processing based on fresh milk is a known practice.</p> | <p>Potential demand for fresh milk products provided the right price and issue of cold chain is addressed</p> |

| | Milk Production | Milk collection | Milk Processing | Distribution and marketing |
|-----------------------------------|--|---|--|--|
| Priority actions mentioned | <p>Set up a national dairy development fund</p> <p>Design a livestock master plan that includes a public policy on dairy</p> <p>Cross breeding to increase milk production per cow</p> <p>Creation of ranches for pastoralists and « new farmers »</p> <p>Establishment of specialised dairy farms</p> <p>Develop the use of milking machines and parlours</p> <p>Upgrading of grazing reserves</p> <p>Development of commercial pasture production, fodder production and silage production.</p> <p>Scaling up of feed and agricultural and industrial by-products</p> <p>Scaling up of vaccines</p> <p>Develop technical support and training on dairy farming practices, including on milking and milk management.</p> <p>Set up an information system on livestock</p> | <p>Set up a national dairy development fund</p> <p>Road infrastructure</p> <p>Power supply</p> <p>Support access to cooling equipment</p> <p>Incentives to ease import of equipment (Automatic zero duty for the importation of dairy equipment)</p> <p>Engagement with pastoralist producers to increase milk collection</p> | <p>Set up a national dairy development fund</p> <p>Temporarily and progressively increase tariffs or levies on dairy imports to make fresh milk more price-competitive for dairies</p> <p>- Impose a 15% duty on vegetable fat-filled powdered milk</p> <p>- Set up a dairy development levy on all imported dairy products</p> <p>- Impose a 100% duty on liquid milk products</p> <p>Push for incorporation of local content in dairy processing for all importers of powder milk</p> <p>Incentives to ease import of equipment (Automatic zero duty for the importation of dairy equipment)</p> | <p>Power supply</p> <p>Road infrastructure</p> |

Table 7: Challenges, strenghts and opportunities for action identified in the Nigeria value chain

Conclusion on the dairy value chain in Nigeria

The analysis of the dairy value chain in Nigeria is made difficult by a lack of national and state-level data on dairy production, collection, processing and marketing. There is indeed no system in place for the collection and management of data and information on the subject. However, literature review and interviews have allowed to identify the following key challenges for the future development of milk and dairy in Nigeria.

1. **There is a shared belief that milk production can increase in Nigeria but plans and expectations over how dairy production will be scaled up do not necessarily completely converge.**
 - On priority measures to increase milk production: Several stakeholders want to focus on artificial insemination and cross-breeding as one key measure to increase production through the improvement of yields per cow. Other stakeholders consider that the potential for milk production increase already exists with the current national herd, and that access to feed, grazing and water are key to increase production per cow. They also consider that artificial insemination and cross breeding will take place eventually once the key inputs for cattle raising are in place.
 - On pastoralism, settlement and dairy production: There is an apparent lack of convergence on how the question for the future of pastoralism must be dealt with. Given the current tensions and violent conflicts (leading to human death) between herders and farmers in some States in Nigeria, the future of the dairy value chain is not discussed outside of this specific context. The government has a clear intent on settling pastoral farmers to put an end to mobility seen as the cause of conflicts: the development of dairy ranches and specialised zones then appear as a mean to fix and retain pastoralists in dedicated areas. On the other hand, pastoralist producer organisations and some actors working with them have pointed at the fact that forcing the settlement of pastoralists has not worked in the past and will not work in the future. They recommend a public policy approach centred on the need to secure access to land, water and feed for pastoral producers, arguing that pastoralists keep moving their herds because they don't find enough grass and water in the areas where they are located. Effort to support milk production (including through securing access to grass and water) and strengthen the local milk collection and processing would lead to willing pastoralists settling down, or semi-settling, to respond to the market and income opportunities offered by the development of the dairy value chain. Several stakeholders, including major dairy companies, have mentioned that the development of milk production in Nigeria would mean a shift from the current mobile cattle raising models to specialised dairy farms; they are already working on developing such models of smallholder dairy farms. The question of what « transformation » or « transition » pastoralist communities will go through, and what impact this will have on their welfare, development and livelihoods is an issue that needs further discussions and research to identify opportunities and risks, and ways to address them.
2. There is consensus on the fact that 2 overarching development challenges in Nigeria hamper the development of milk collection, processing and distribution in the country: **Poor road infrastructure and lack of permanent power supply to sustain the cold chain** are seen as increasing the costs of milk collection, discouraging stakeholders from building permanent milk supply chains, and strongly limiting the consumption choices of dairy consumers at the end of the chain, with a strong comparative advantage of imported milk powder over fresh milk for storage and health safety guarantees.

3. **There is no strong consensus on how to address the current competition between imported milk powder and locally produced milk.** The government lowered tariffs on dairy imports from 10% to 5%, which met the opposition of several local dairy stakeholders. Everybody recognises that milk powder currently supplies proteins to a high number of poor households in Nigeria and cannot be replaced throughout Nigeria from one day to the next with fresh milk products. Some actors consider that there will be no sense and no interest in increasing tariffs on dairy imports in the next 5 to years before milk production in Nigeria has significantly increased and led to the structuring of a local milk value chain that reaches poor consumers. Stakeholders involved in local dairy processing consider that milk powder needs to be made more expensive to signal to investors to get involved in the local milk value chain, and to push dairy companies to choose in favour of local milk collection in their operations and investment choices. **There appears to be a need for a clear and credible economic roadmap to clarify to all actors how in the short and medium term local milk production will be supported in the face of much cheaper milk powder imports.**
4. **There has been hardly any mention of plans or systems to strengthen mutually beneficial services between agriculture and livestock production, especially in terms of use of agricultural by-products and production of feed, and improvement of grazing areas' productivity through agroforestry:** The expansion of commercial agriculture in Nigeria threatens livestock areas in some regions, but could also provide with opportunities to increase the quantity and decrease the cost of access to feed and agricultural by-products. Besides, the need to replant trees and restore grazing ecosystems in the North of Nigeria was not developed in any plan.
5. **Other policy options to support the demand for fresh milk have been very rarely discussed and do not seem to have a strong role in the general conversation on the future of the dairy value chain in Nigeria:** clear and strict rules on labelling of products to inform about products' content (Content in fat-filled milk powder, in milk powder, and in fresh milk), minimum ratios of local milk sourcing for all major companies processing dairy in Nigeria, public purchase of local dairy products for schools or other public facilities, incentives and subsidies for local milk value chain actors, etc.

Appendix 1: Currency exchange rates


Average Naira/West African CFA France exchange rate used: NGN 1 = CFA Franc 1.5





Average Naira/Euro exchange rate used: NGN 1 = Euro 0,0023





Average Naira/Euro exchange rate used: NGN 1 = Euro 0,0028


 **OANDA**
Solutions for Business



 Historical
Exchange Rates





 Exchange
Rates API

 Corporate FX
Payments


 FX News

 Support












EN  Sign In 







Range: **January 24, 2018 - July 23, 2018**  Frequency: **Daily**  Source: **OANDA Exchange Rates**  Price: **Bid** 

Currency I have:

Nigerian Naira 

 Currency I want:

USD 0.0028           

Appendix 2: Price assessment of dairy products in SPAR supermarket in Lagos City, Nigeria, July 2018

Dairy price assessment in a hypermarket
In Lagos City, Nigeria
SPAR 23/07/18

| Liquid yoghurt | | | | | |
|-----------------------|--------------------|--------------------|----------------------------|------------------------------|----------------|
| Brand | Volume (mL) | Price (NGN) | Price/Litre (NGN/L) | Company or Dairy Farm | Content |
| Farm Pride | 1,000 | 1,020 | 1,020 | Nyyia | Milk powder? |
| Farm Pride | 500 | 575 | 1,150 | Nyyia | Milk powder? |
| FarmFresh | 1,000 | 1,300 | 1,300 | Integrated Dairies | Milk powder? |
| L&Z | 1,000 | 1,105 | 1,105 | L&Z Farms | Fresh milk |
| L&Z | 500 | 560 | 1,120 | L&Z Farms | Fresh milk |
| Kylin | 1,000 | 585 | 585 | | Milk powder |
| Kylin | 500 | 420 | 840 | | Milk powder |
| Estate | 1,000 | 500 | 500 | | Milk powder |
| Estate | 500 | 295 | 590 | | Milk powder |
| De Thirsty | 1,000 | 450 | 450 | | Milk powder |
| De Thirsty | 500 | 235 | 470 | | Milk powder |
| Olympic | 500 | 220 | 440 | PZ Cussons | Milk powder |
| Olympic | 115 | 65 | 565 | PZ Cussons | Milk powder |
| Nutri Yo | 500 | 190 | 380 | PZ Cussons | Milk powder |
| Cedaa | 500 | 195 | 390 | Cedar D'Vine | Milk powder |
| Cedaa | 750 | 325 | 433 | Cedar D'Vine | Milk powder |
| Hollandia | 1,000 | 550 | 550 | CHI Ltd | Milk powder |
| Hollandia | 400 | 300 | 750 | CHI Ltd | Milk powder |
| Hollandia | 315 | 180 | 571 | CHI Ltd | Milk powder |
| Hollandia | 180 | 90 | 500 | CHI Ltd | Milk powder |
| Hollandia | 100 | 50 | 500 | CHI Ltd | Milk powder |
| FreshYo | 1,000 | 550 | 550 | Ranona Ltd | Milk powder |
| FreshYo | 400 | 300 | 750 | Ranona Ltd | Milk powder |
| FreshYo | 115 | 65 | 565 | Ranona Ltd | Milk powder |
| Fantastic | 200 | 175 | 875 | FAN Milk | Milk powder |

| <u>UHT Milk</u> | | | | | |
|------------------------|--------------------|--------------------|----------------------------|---------------|-------------|
| Brand | Volume (mL) | Price (NGN) | Price/Litre (NGN/L) | Origin | |
| Dano | 1,000 | 560 | 560 | Germany | |
| Peak | 1,000 | 540 | 540 | Belgium | |
| Emborg | 1,000 | 610 | 610 | Germany | |
| Crystal Valley | 1,000 | 400 | 400 | Poland | |
| Hollandia | 1,000 | 525 | 525 | Nigeria | Milk Powder |
| Oldenburger | 1,000 | 620 | 620 | Germany | |
| SPAR | 1,000 | 560 | 560 | Germany | |
| Lactel | 1,000 | 900 | 900 | Belgium | |

Appendix 3: Price assessment of dairy products in Shoprite supermarket in Lagos City, Nigeria, July 2018

Dairy price assessment in a hypermarket
in Lagos, Nigeria, July 2018
Shoprite 22/07/18

| Milk Powder in sachets | | | | | |
|------------------------|------------|-------------|-----------------|-------------|------------------------------------|
| Brand | Weight (g) | Price (NGN) | Price/g (NGN/g) | Company | Content (if not whole milk powder) |
| Peak | 380 | 800 | 2.11 | FC WAMCO | Fat Filled Milk Powder |
| Peak | 400 | 1,100 | 2.75 | FC WAMCO | |
| Peak | 850 | 2,000 | 2.35 | FC WAMCO | |
| Peak | 14 | 45 | 3.21 | FC WAMCO | Fat Filled Milk Powder |
| Peak | 16 | 60 | 3.75 | FC WAMCO | |
| Three Crowns | 380 | 800 | 2.11 | FC WAMCO | Fat Filled Milk Powder |
| Olympic | 360 | 690 | 1.92 | PZ Cussons | Fat Filled Milk Powder |
| Nunu | 400 | 740 | 1.85 | PZ Cussons | Fat Filled Milk Powder |
| Coast | 400 | 1,090 | 2.73 | PZ Cussons | |
| Forto | 380 | 860 | 2.26 | Ornua | Fat Filled Milk Powder |
| Kerrygold | 380 | 1,250 | 3.29 | Ornua | |
| Oldenburger | 400 | 1,100 | 2.75 | Oldenburger | |
| Oldenburger | 400 | 1,000 | 2.50 | Oldenburger | Skimmed Milk Powder |
| Popular | 380 | 865 | 2.28 | | Fat Filled Milk Powder |
| Luna | 400 | 1,050 | 2.63 | Givanas | |
| Jago | 400 | 1,060 | 2.65 | Sosaco | |
| Miksi | 400 | 780 | 1.95 | Promasidor | Fat Filled Milk Powder |
| Cowbell | 400 | 890 | 2.23 | Promasidor | Fat Filled Milk Powder |
| Cowbell | 900 | 1,800 | 2.00 | Promasidor | Fat Filled Milk Powder |
| Cowbell | 2,500 | 5,020 | 2.01 | Promasidor | Fat Filled Milk Powder |
| Loya | 400 | 1,105 | 2.76 | Promasidor | |
| Loya | 900 | 2,350 | 2.61 | Promasidor | |
| Hollandia | 400 | 1,100 | 2.75 | CHI | |
| Dano | 150 | 340 | 2.27 | Arla | Fat Filled Milk Powder |
| Dano | 360 | 700 | 1.94 | Arla | Fat Filled Milk Powder |
| Dano | 360 | 1,020 | 2.83 | Arla | |
| Dano | 400 | 1,000 | 2.50 | Arla | Skimmed Milk Powder |
| Dano | 900 | 1,800 | 2.00 | Arla | Fat Filled Milk Powder |
| Dano | 850 | 2,040 | 2.40 | Arla | |
| Dano | 2,500 | 6,000 | 2.40 | Arla | |
| Dano | 2,500 | 4,790 | 1.92 | Arla | Fat Filled Milk Powder |
| Family | 400 | 880 | 2.20 | ? | |

| Milk Powder in cans | | | | | |
|----------------------------|-------------------|--------------------|------------------------|----------------|---|
| Brand | Weight (g) | Price (NGN) | Price/g (NGN/g) | Company | Content (if not whole milk powder) |
| Kerrygold | 400 | 1,500 | 3.75 | Ornua | |
| Kerrygold | 900 | 3,260 | 3.62 | Ornua | |
| Kerrygold | 2,500 | 7,500 | 3.00 | Ornua | |
| Forto | 400 | 1,200 | 3.00 | Ornua | Fat Filled Milk Powder |
| Forto | 900 | 2,650 | 2.94 | Ornua | Fat Filled Milk Powder |
| Forto | 2,500 | 7,100 | 2.84 | Ornua | Fat Filled Milk Powder |
| Dano | 400 | 1,200 | 3.00 | Arla | |
| Dano | 400 | 1,200 | 3.00 | Arla | Skimmed Milk Powder |
| Dano | 400 | 1,000 | 2.50 | Arla | Fat Filled Milk Powder |
| Dano | 900 | 2,200 | 2.44 | Arla | Fat Filled Milk Powder |
| Dano | 900 | 2,500 | 2.78 | Arla | |
| Dano | 900 | 2,600 | 2.89 | Arla | Skimmed Milk Powder |
| Dano | 2,500 | 7,200 | 2.88 | Arla | |
| Dano | 2,500 | 5,000 | 2.00 | Arla | Fat Filled Milk Powder |
| Cowbell | 400 | 1,000 | 2.50 | Promasidor | Fat Filled Milk Powder |
| Cowbell | 900 | 2,200 | 2.44 | Promasidor | Fat Filled Milk Powder |
| Loya | 400 | 1315 | 3.29 | Promasidor | |
| Peak | 400 | 1300 | 3.25 | FC WAMCO | |
| Peak | 900 | 2700 | 3.00 | FC WAMCO | |
| Peak | 2500 | 7000 | 2.80 | FC WAMCO | |

| <u>Yoghurt</u> | | | | | | |
|-----------------------|--------------------|--------------------|----------------------------|-------------------------|-------------------|----------------|
| Brand | Volume (mL) | Price (NGN) | Price/Litre (NGN/L) | Company | Dairy Farm | Content |
| L&Z | 500 | 575 | 1,150 | | L&Z Farms | Fresh milk |
| Nutriday | 1,000 | 1,600 | 1,600 | Danone | | SMP |
| Crystal Valley | 1,000 | 1,050 | 1,050 | ? | | SMP |
| Dolait | 500 | 700 | 1,400 | Dolait (Benin) | | WMP |
| Rev Up | 750 | 800 | 1,067 | Rev Foods and Beverages | | WMP-SMP |
| Rev up | 350 | 500 | 1,429 | | | WMP-SMP |

| <u>Fruit Milk Drink</u> | | | | | |
|--------------------------------|--------------------|----------------------|--------------------------|----------------|------------------------|
| Brand | Volume (mL) | Price (Naira) | Price/Litre (N/L) | Company | Content |
| Blue Boat | 65 | 115 | 1,769 | Ranona Ltd | Fat Filled Milk Powder |

| <u>Liquid yoghurt</u> | | | | | |
|------------------------------|--------------------|----------------------|--------------------------|-------------------------|--------------------|
| Brand | Volume (mL) | Price (Naira) | Price/Litre (N/L) | Company | Dairy Farm |
| Farm Pride | 1,000 | 1,050 | 1,050 | | Nyyia |
| Farm Pride | 500 | 590 | 1,180 | | Nyyia |
| L&Z | 1,000 | 1,135 | 1,135 | | L&Z |
| L&Z | 500 | 575 | 1,150 | | L&Z |
| Farm Fresh | 1,000 | 1,150 | 1,150 | | Integrated Dairies |
| Farm Fresh | 1,000 | 700 | 700 | (Skimmed milk) | Integrated Dairies |
| Habib | 1,000 | 1,800 | 1,800 | Habib Yoghurt and Foods | |
| Hollandia | 1,000 | 535 | 535 | CHI Ltd | |
| Hollandia | 500 | 300 | 600 | CHI Ltd | |
| Hollandia | 315 | 180 | 571 | CHI Ltd | |
| Hollandia | 200 | 90 | 450 | CHI Ltd | |
| Hollandia | 100 | 50 | 500 | CHI Ltd | |
| FreshYo | 1,000 | 500 | 500 | Ranona Ltd | |
| FreshYo | 500 | 300 | 600 | Ranona Ltd | |
| FreshYo | 115 | 70 | 609 | Ranona Ltd | |
| Fantastic | 200 | 145 | 725 | FAN Milk | |

| <u>UHT Milk</u> | | | | | |
|------------------------|--------------------|--------------------|----------------------------|----------------|---------------|
| Brand | Volume (mL) | Price (NGN) | Price/Litre (NGN/L) | Company | Origin |
| Dano | 1,000 | 640 | 640 | Arla | Germany |
| Peak | 1,000 | 630 | 630 | FC WAMCO | Belgium |
| Emborg | 1,000 | 600 | 600 | Uhrenholt | Germany |
| Crystal Valley | 1,000 | 400 | 400 | ? | Poland |
| Hollandia | 1,000 | 550 | 550 | CHI Ltd | Nigeria |
| Oldenburger | 1,000 | 650 | 650 | Oldenburger | Germany |

| <u>Butter</u> | | |
|----------------------|----------------------------|----------------|
| Brand | Price/Litre (NGN/L) | Company |
| Président | 300/100g | Lactalis |
| Kerrygold | 720/100g | Ornua |
| Emborg | 300/100g | Uhrenholt |
| Flécharde | 300/100g | Flécharde |
| Paysan Breton | 300/100g | Laita |
| Ambassador | 300/100g | Lactalis |

| Ice cream (None based on fresh milk) | | | | | |
|---|--------------------|--------------------|----------------------------|-------------------------|-------------------|
| Brand | Volume (mL) | Price (NGN) | Price/Litre (NGN/L) | Company | Dairy Farm |
| Supreme | 4,000 | 2,930 | 733 | UAC Foods | |
| Supreme | 500 | 540 | 1,080 | UAC Foods | |
| Supreme | 220 | 270 | 1,227 | UAC Foods | |
| Golden Scoop | 4,000 | 2,940 | 735 | Provita Vitaforce Foods | |
| Golden Scoop | 2,000 | 1,820 | 910 | Provita Vitaforce Foods | |
| Golden Scoop | 1,000 | 1,050 | 1,050 | Provita Vitaforce Foods | |
| Golden Scoop | 500 | 450 | 900 | Provita Vitaforce Foods | |
| Golden Scoop | 250 | 300 | 1,200 | Provita Vitaforce Foods | |
| Golden Scoop | 100 | 95 | 950 | Provita | |
| FANIce | 4,000 | 2,800 | 700 | FAN Milk | |
| FANIce | 500 | 430 | 860 | FAN Milk | |
| FANIce | 120 | 160 | 1,333 | FAN Milk | |
| Solona | 1000 | 910 | 910 | ? | |
| Solona | 500 | 490 | 980 | ? | |
| Solona | 250 | 240 | 960 | ? | |
| Solona | 120 | 110 | 917 | ? | |
| L&Z | 500 | 600 | 1,200 | | L&Z Farms |
| L&Z | 250 | 320 | 1,280 | | L&Z Farms |
| Ritebrand | 2000 | 2000 | 1,000 | ? | |
| Rockyroad | 2000 | 2000 | 1,000 | ? | |
| Country Fresh | 1800 | 2500 | 1,389 | R&R Ice Cream | |

Appendix 4: List of persons contacted/met for the study

| Name | Position - Organisation | Contact |
|---------------------------|---|--|
| Mohammed Bello | Director of the Confederation of Traditional Herders Organization (CORET) | mbellotukur@yahoo.com |
| Poul Jakob Erykstrup | Arla and Danish Trade Cooperation Service | pjerik@um.dk |
| Amaka Odogwu Kolawole | Regional Head of Business Development, Arla in West Africa | amaka.kolawole@arlafoods.com |
| Sybren Attema | Global manager of the global Dairy Development Programme, FrieslandCampina | sybren.attema@frieslandcampina.com |
| John Olayiwola Adekunle | Manager of FrieslandCampina's Dairy Development Programme in Nigeria | Olayiwola.Adekunle@frieslandcampina.com |
| Winnie Lai-Solarin | Deputy Director of Animal Husbandry Services, Direction of Animal Production, FMARD | winlaw995@gmail.com |
| Ahmed Matane | Coordinator of Programme Activities, Acting Assistant FAO Representative, FAO | Ahmed.Matane@fao.org |
| Lilian Puech | Livestock expert at the World Bank | |
| Muhammad Damakka Abubakar | Managing Director of L&Z Integrated Farms Nigeria | yarodamakka@gmail.com |
| Dr. Celestine Ayok | Dairy Consultant at DFID and managing Director of Spring Dairies | celestineayok@yahoo.com |
| Emmanuel Odunze | FAO, Africa Sustainable Livestock 2050 Facilitator | emmaodunze1@yahoo.com |
| Atinuke Akinyemi | Ex-FrieslandCampina staff, dairy livestock raising expert in Oyo State | atinuke.akinyemi@yahoo.com |
| Alex Goma | Managing Director of PZ Cussons Nigeria | Alex.Goma@pzcussons.com |
| Lara Suleiman | Agriculture Consultant for Majestik Farms and other clients | info@majestikfarms.com |
| Ali Bala Saidu | Salid Agriculture Nigeria | salidagriculture@gmail.com |
| Oyin Ogunleye | Cattle ranch owner in Ogun State | ogunleyeoyin@gmail.com |

Appendix 5: Bibliography

Abbass, I.M., No retreat no surrender: Conflict for survival between Fulani pastoralists and farmers in Northern Nigeria, European Scientific Journal, vol.8, n°1, 2011.

Abdullahi, M., Kyiogwom, U., Tanko, L., and Jibir, M., Dairy products consumption prevalence in Northern Nigeria: A study of Sokoto metropolis, International Journal of innovative research and development, vol.3, issue 13., 2014.

Annatte, I.; Fatima, B.A.; Wambai, Y.; Ruma, B.; Gideon, M.M.; Lawal, U.S; Lawrence, O.I; Aligana, M.; Shoffela, A.K.; Mark, L.K.; and Kasim, H.I., Major issues in Nigeria dairy value chain development, Vom Journal of Veterinary Science, vol. 9, pp.32-39, 2012.

Annatte, I., Gana, M., Ogundipe, G.A.T., Dafwang, I.I., Rural dairy cooperative development systems: a case study of Kaduna pilot dairy project in Nigeria, Proceedings of the 11th Symposium of the International Society for Veterinary Epidemiology and Economics, Cairns, Australia, 2006

Annatte, I., Ogundipe, G.A.T., Study of benefits and costs of Kaduna pilot dairy project, Nigeria, 2002.

Arla, Human rights assessment in Nigeria, 2015.

Ayok, C., Dairy sector in Nigeria – An overview, slide presentation, 2014.

Blench, R., Traditional livestock breeds: Geographical distribution and dynamics in relation to the ecology of West Africa, Overseas Development Institute, 1999.

Business Innovation Facility, L&Z Integrated Farms Limited, Integrated distribution of dairy products, project profile, 2013.

CODARAN, Key policy thrusts for the dairy sector, presentation to the Federal Ministry of Industry, Trade and Investment, 2018.

CODARAN, Policy actions suggestions for a sustainable livestock industry in Nigeria, Submission to FAO Africa Sustainable Livestock 2050, 2018.

CODARAN, Strategic growth actions for Nigeria's commercial dairy sector, 2018

Federal Government of Nigeria, The national livestock transformation plan, media presentation, 2018.

Federal Ministry of Agriculture and Rural Development, The Agriculture promotion policy (2016-2020),

Policy and strategy document, 2016.

Forrest, T., The advance of African Capital: The growth of Nigerian private enterprises, 1994

FrieslandCampina, Dairy Development Programme, Enabling value creation by delivering Dutch dairy expertise.

IFDC, Dairy Development Programme in Nigeria, Baseline report, key findings and recommendations, 2012.

Ikhuoria, E., Gisanrin, F., Onyegbulam, L., Report of social impact assessment for the Milky Way partnership project in Nigeria: Market driven sustainable growth in the dairy value chain, 2016.

Ilu, I. A. Frank, and Annatte, I., Review of the livestock/meat and milk value chains and policy influencing them in Nigeria, FAO and ECOWAS, 2016.

International Crisis Group, Herders against farmers: Nigeria's expanding deadly conflict, Africa report n°252, 2017.

Makun, H., Dairy production systems in Nigeria, slide presentation, 2018.

Muhammed, I., Ismaila, A.B., Bibi, U.M., An assessment of farmer-pastoralist conflict in Nigeria using GIS, International Journal of Engineering Science invention, vol4, Issue 7, July 2015. pp. 23-33.

PWC, Transforming Nigeria's agricultural value chains, A case study of the cocoa and dairy industries, 2017.

Sahel Capital Partners, Adverse implications of the reduction in tariffs on imported dairy products to the local Nigerian dairy Industry, Presentation to the Minister of Trade, Industry and Investment, 2018