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DISCUSSION PAPER ON THE DEVELOPMENT OF NEW WORK ON A CAMEL MILK COMMODITY STANDARD

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1. Background

The United Nations has designated 2024 as the International Year of Camelids (IYC 2024) to spotlight the overlooked potential of camelids.

Raising awareness and encouraging increased investment in the camelid sector aligns with the objectives of this year, with added support to research, capacity development, and the adoption of innovative practices and technologies in the food production sector. Camelids, through the provision of milk and meat, contribute significantly to the advancement of Sustainable Development Goals (SDGs), specifically those addressing hunger, the elimination of extreme poverty, the empowerment of women, and the sustainable utilization of terrestrial ecosystems.

Furthermore and during the 11th session of the Codex Committee for the Near East (CCNE11), which was held at FAO Headquarters, Rome, Italy, from 18 September to 22 September 2023, the United Arab Emirates (UAE) introduced a proposal to develop a regional standard for pasteurized Camel Milk of the species *Camelus dromedarius* (one-humped camel), highlighting the increase in Camel Milk production and trade, at regional and international levels, and therefore the importance to develop both regional and international standards for this commodity.

Developing Codex texts including a possible Codex standard that covers Camel Milk products would align with the increasing interest in Camel Milk consumption and trade. This is due to the distinct characteristics of Camel Milk products, encompassing interesting and unique compositional attributes when compared to other dairy products, as well as increasingly well documented nutritional benefits, positioning them as one of the most valuable food sources for people residing in arid and semi-arid regions.

β-lactoglobulin, one of the main milk allergens and a highly prevalent protein found in whey products, is naturally absent from Camel Milk. This feature makes Camel Milk and its products closer to human milk, with a lower allergenic potential, and places such products in high market demand.

Such demand for Camel Milk products has been shown to increase outside of the historically known regions that produce and consume these products, i.e., outside of Asia and the Near East, with exports reaching European and North American markets, where it is currently attracting increasing interest.

The unique attributes of Camel Milk products coupled with the increased interest and trade opportunities make these products subject to illicit manufacturing and false representation practices leading to consumer deception and fraud; thus, threatening the integrity of this valuable commodity's supply chain.

A global standard covering the specificities of Camel Milk products and offering guidance on their conditions of production and characterization, that account for the unique attributes of these products, while leveraging existing Codex standards on milk and milk products, would contribute to the protection of this important commodity from fraudulent activities when traded internationally.

An international standard would also support the development of a thriving dairy sector in regions of the world where production continues to follow traditional methods and would therefore benefit from more standardized

conditions of production, in line with Codex standards for milk and milk products, which would be further adapted to accommodate some of the technological challenges stemming from specificities of Camel Milk products.

This will not only align with the Codex mandate of protecting consumers' health and enabling fair practices in the food trade but would also support economic and human development in various regions of Africa, Asia, and the Near East, where Camel Milk production is known to be prevalent and abundant.

This discussion paper offers an analysis of the current environment of Camel Milk production, the specificities of these products, the challenges faced by production and trade of Camel Milk products and **how Codex standards may offer mitigation measures** for these challenges, in addition to, enablers for the sector's development.

This paper references material gathered from published information, in the scientific literature including data and information shared during the International Symposium on Camel Milk Products, hosted by the United Arab Emirates, in Abu Dhabi from 24-25 September 2024. This Symposium witnessed participation from various countries of the Near East, Africa, Central Asia, and Europe. The discussion paper also incorporates valuable feed-back from informal consultations with a broad range of Codex contact points facilitated by the coordinators of all Codex regions: the Near East, Africa, Europe, Latin America and the Caribbean and North America and the South-West Pacific. These consultations were carried out from September to November 2024.

The Discussion Paper attempts to offer a path forward for a proposed Codex work on Camel Milk products and is supported by a draft project document for such new work for consideration by the 47th Session of the Codex Alimentarius Commission.

2. Production and Trade of Camel Milk Products and Potential for Growth

The Food and Agriculture Organization (FAO) issued statistics of camel milk from 1961 until 2022. Since 1961, the annual growth in camel milk production is estimated to be at 6.5% (Konuspayeva et al., 2023).

Data reported by FAOSTAT (2022) shows that Kenya leads world producers of Raw Camel Milk, followed by Somalia, Pakistan, Mali, Ethiopia, Saudi Arabia, Niger, and the United Arab Emirates.

In 2022, global Camel Milk production reached 4,116,669 tons. From 2014 until 2022, global Camel Milk production experienced a typical increase of 0.83%, increasing from 3,430,675 tons to 4,116,669 tons.

Table 1 shows the production of Raw Camel Milk for the top producing countries during the year 2022.

Table 1: Raw Camel Milk production during 2022 (in tons) (FAO,2022)

Country	Production (tons)
Kenya	1,096,698
Somalia	987,842.9
Pakistan	944,000
Mali	294,248.6
Ethiopia	220,446
Saudi Arabia	135,540
Niger	106,597.4
United Arab Emirates	79,434.44

The production of total Raw Camel Milk remained unchanged between 2016 and 2022, and Kenya maintained the lead position, followed by Somalia and Pakistan, then by lesser producing countries such as Mali, Ethiopia, Saudi Arabia, Niger, and United Arab Emirates (**Table 1**).

It was reported by Musinga et al. (2008) that in Kenya, as well as in other producing countries such as Saudi Arabia, the Camel Milk sector is dominated by informal trade in both volume and number of stakeholders involved. On the other hand, consumer preference for unprocessed milk (mostly for cultural reasons), and low-level awareness of Camel Milk among non-traditional consumers, have been limiting factors to wider expansion of this trade.

The Profile of Production of Pasteurized Camel Milk differs from that of Raw Camel Milk in terms of countries leading industrialization of production. In this regard, pasteurized Camel Milk produced in the United

Arab Emirates (UAE) is regularly sold across the country in many forms (fresh milk, flavored milk, milk powder, ghee, drinking yoghurt, etc.) and is also exported worldwide (Leila et al., 2022).

While Kenya holds 26% of the global production of Camel Milk, Akweya et al. (2012) reported that only 12% of the total milk produced is traded: 10% sold to rural consumers, and only 2% to urban markets. The remaining 88% is consumed in local households, with a significant proportion going to waste due to post-production losses and the lack of good infrastructure for collection and transport.

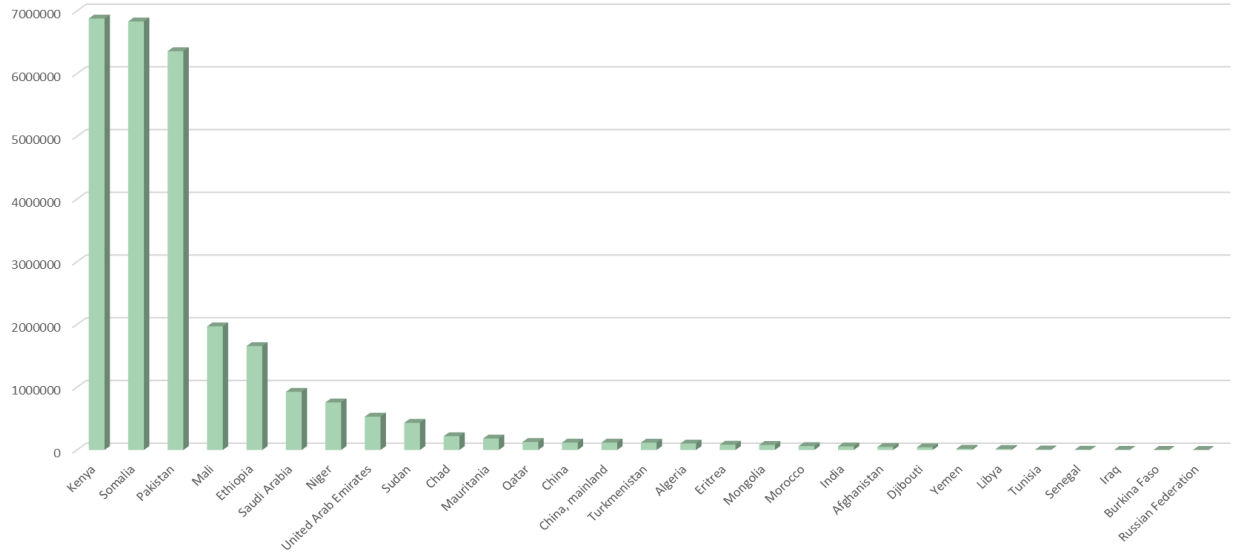

Figure 1: Cumulative Raw Camel Milk Production from 2016 to 2022 (source FAOSTAT 2022).

Several Camel Milk Products were identified as being produced and traded. They include: Pasteurized Camel Milk, Condensed UHT Camel Milk,Traditional Fermented Camel Milk and Dried Fermented Camel Milk Products, Camel Butter, Camel Milk Cheese,Camel Milk Yoghurt, Camel Milk Powder, Camel Milk Ice Cream, and Dried Milk Chocolate.

In addition, fermented Camel Milk is significantly produced in some Asian countries (Kazakhstan, Russia, and Uzbekistan) where it is known under the name of “Shubat”. France is also reported to produce the “Bosse de Fagnes” cheese, a Camel Milk Cheese, which is traded nationally and exported to other EU countries.

Experts and representatives of the production sector that gathered at the International Symposium on Camel Milk Products reported that the production of Pasteurized Camel Milk in the United Arab Emirates exceeds 7,000 tons annually, where 1,800 tons are reported to be exported to the European Union, China and the United States of America. The remainder is consumed locally or traded within the Near-East region.

Data provided by Tunisia indicates that production of Pasteurized Camel Milk reached 5 tons annually. Similarly, and according to export data from the United Arab Emirates,

Camel Milk Powder exports reached 330 tons annually, the equivalent of 3,300 tons of liquid milk.

According to data provided by the Sultanate of Oman, the raw Camel Milk production doubled in 2023 from the production recorded in 2022 going from 1,149.7 tons to 2,367.15 in 2023. The production recorded during the nine first months of 2024 reached 3,755 tons, showing a significant increase. Oman exported the raw liquid milk mainly to the Kingdom of Saudi Arbia. The exported quantities during 2023 reached 2,367 tons.

Overall, Camel Milk powder was reported to be the form of Camel Milk that **is the most produced and traded internationally**, including in Central Asia. The industrial zone of Turkestan in Kazakhstan alone is reported to produce more than 200 tons of dry Camel Milk, which is exported to China, Macau, and Hong Kong[1].

Infant formula produced from Camel Milk is another high value processed product of great interest, with its unique compositional attributes related to the absence of **β-lactoglobulin** which contributes to making this breast milk substitute much closer to human milk.

[1] https://dairynews.today/global/news/camel-milk-powder-from-turkestan-region-is-exported-to-china-macau-and-hong-kong.html Accessed on October 25th, 2024

3. Economic Value of Camel Milk Products

The high economic value of Camel Milk stems from several factors such as the limited supply, the specialized farming conditions, the labor and handling costs, the processing challenges and distribution costs, as well as the increasingly reported health benefits.

Although identified as a niche market, the trade of Camel Milk is reported to be progressing consistently across several markets from Europe, the United States and countries in Africa and the Middle East (Seifu, E., 2023).

The increasing interest in this commodity has led to multiple attempts of documented adulteration, where Camel Milk powder was reported[2] to be diluted with bovine milk powder at export markets, prior to being used in several product formulations.

The **absence of a standard** that can support the **attestation of authenticity** of products represents a **hindrance to the development of the commodity** and may possibly contribute to these food fraud attempts.

An international standard under the auspices of the Codex Alimentarius Commission, would support:

- Maintaining the integrity of the Camel Milk Products supply chain by enabling a standard of authenticity
- Better dissemination of the knowledge about Camel Milk products supporting their broader uptake in various markets, and
- Enabling improved guidance to producers about the specificities of Camel Milk product requirements that must be considered when applying the Codex dairy standards already in place, including any new set of conditions that would be specific to Camel Milk due to its unique attributes.

4. Specificities and Distinct Characteristics of Camel Milk: Nutritional Value and Lower Allergenicity Potential

Since ancient times, Camel Milk has been used as a food and /or as a food for special use, including in traditional medicine as a cure for several diseases such as oedema, jaundice, tuberculosis, diabetes, asthma and leishmaniasis, etc. These nutraceutical properties are mainly due to its naturally occurring bioactive components (Muthukumaran et al., 2023).

The general composition of Camel Milk varies depending upon the region, breed, season, and lactation stage. In fact, the variation in the composition of milk from different camel types, as in other species, are attributed to genetic (breed) and non-genetic factors (physiological stage, feeding management practices, health status, sampling conditions) (Konuspayeva, 2020; Liu, et al., 2023). Seasonal variations may also play a role in Camel Milk composition, even for camels from the same species and regions (Al haj & Al Kanhal, 2010). The primary compositional characteristics of Camel Milk pertain to its protein, fat, lactose, minerals, and vitamin content profiles.

4.1 Proteins

Caseins in Camel Milk were reported to account for 61.8–88.5% (Ho et al., 2022) or 52-87% (Seifu, 2023) of the total protein – versus 82% in cow and buffalo milk, 78% in sheep and goat milk, 52% in mare milk, and 33% in human milk (Konuspayeva, 2020). Camel Milk contains a high percentage of β-casein (65% of total caseins) (Ho et al., 2022) – versus approximately 39% in bovine milk (Seifu, 2023). The **abundance of β-casein** is similar **to what is found in human milk** and is known to contribute to easier digestibility, as these proteins are less resistant to peptide hydrolysis than αS-casein (Ho et al., 2022). αS1-casein, αS2-casein, and κ-casein constitute 21, 10, and 3.5% of the total caseins in Camel Milk, respectively (Ho et al. 2020). Clotting difficulties of Camel Milk during cheese processing are attributed to the low proportion of κ-casein (Konuspayeva, 2020) – lower than that of bovine milk (13%; Seifu, 2023). In addition, Camel Milk contains higher numbers of large micelles than bovine milk (Seifu, 2023). The casein micelle diameter of camel, goat and bovine milks is 380 nm, 260 nm, and 150 nm, respectively (Seifu, 2023). The differences in micelle size and casein fractions have technological implications (Seifu, 2023).

Whey proteins in Camel Milk (20-25% of the total proteins) (Seibu, 2023) are characterized by a high content of α-lactalbumin and lactoferrin, **and the absence of β-lactoglobulin (a major allergen in bovine milk)** (Konuspayeva, 2020; Ho et al., 2022).

Whey acidic protein (WAP) and peptidoglycan-recognition protein (PGRP) – potentially bioactive proteins – are present in Camel Milk but not in bovine milk (Al haj & Al Kanhal, 2010; Konuspayeva, 2020; Ho et al., 2022).

[2] Industry Input during the International Symposium on Camel Milk Products hosted by the United Arab Emirates from 24-25 September 2024.

Amino acid composition of Camel Milk and bovine milk casein fractions is quite similar; however, Camel Milk contains less cysteine and more proline (Ho et al., 2022).

4.2 Lipids

Compared with bovine and human milk fats, Camel Milk fat contains only small amounts of short-chain fatty acids (C4–C12), but a higher concentration of long-chain fatty acids (C14-C18) (Al haj & Al Kanhal, 2010; Konuspayeva, 2020; Ho et al., 2022), with palmitic acid C16:1 content accounting for 10.13% of total fatty acids (TFA), which is much higher than that of cow or goat's milk (Liu et al., 2023).

While the ratio of saturated/unsaturated fatty acids is similar for Camel Milk and bovine milk (67.7 and 69.9, respectively), the proportion of unsaturated fatty acids is higher in Camel Milk (Konuspayeva, 2020). Thus, Camel Milk has a better atherogenic index (associated with the onset of coronary heart disease) than bovine milk (Konuspayeva, 2020). However, the scope of the original study reporting these results (Faye et al., 2008) is limited (31 samples, Dromedary and Bactrian camels, collected in different seasons, in Kazakhstan). Also, Camel Milk was found to be relatively richer in conjugated linoleic acid compared to human and bovine milk (1.23, 0.42 and 0.65g/100g fat, respectively) (Konuspayeva, 2020).

The average diameter of milk fat globules has been reported as 2.99 µm for camel, 3.2 µm for goat, 3.78 µm for sheep, 3.95 µm for bovine, and 8.7 µm for buffalo milk (Ho et al., 2022). As small fat globules are more vulnerable to lipolytic enzymes, camel and goat milk may be more easily digested (Ho et al., 2022). However, this leads to some technological processing difficulties for some applications like in butter making (Seifu, 2023).

4.3 Lactose

Lactose content in Camel Milk is similar to that of bovine milk (Ho et al., 2022). Lactose concentration variations in Camel Milk are considered among the major reasons for the reported differences in its taste (Ho et al., 2022). Despite similar lactose content, low lactose intolerance of Camel Milk compared to bovine milk has been reported (Konuspayeva, 2020; Ho et al., 2022). One possible reason is Camel Milk's lower concentration of casomorphin, which contributes to reduced intestinal motility, thus exposing lactose to lactase action over a longer period (Ho et al., 2022). Another explanation may be the high content of L-lactate in raw Camel Milk – 100 times higher than in bovine milk (Ho et al., 2022).

4.4 Minerals

Ash content in Camel Milk is similar to that in bovine milk, but much higher than in human milk (Ho et al., 2022). Some values (in mg/100 g) reported in the literature might be averaged as follows: calcium 111.4; magnesium 6.7; phosphorus 81.2; sodium 57.8; potassium 156.3, while the corresponding concentrations in bovine milk are 119.9, 13.4, 95.0, 49.7, and 147.0, respectively (Ho et al., 2022). The concentrations of these minerals are much lower in human milk: 32.4, 3.4, 14.0, 16.0, and 51.8 mg/100 g, respectively (Ho et al., 2022). It is noteworthy to mention that iron concentration in Camel Milk was reported to be six times higher than in bovine milk (Ho et al., 2022).

4.5 Vitamins

Camel Milk is known for **higher vitamin C** (Ho et al., 2022), and vitamin D (Konuspayeva, 2020) content than bovine milk – while bovine milk contains more vitamin A (Ho et al., 2022). Camel and bovine milks contain similar levels of vitamins B1 and B6 (Ho et al., 2022). Data for other vitamins are limited and varied.

4.6 Conclusion

While differences exist in the composition of Camel Milk and Camel Milk products as a result of species variations as well as the diversity of the geographic areas where Camels are raised, it is possible to establish general trends for levels of key macronutrients that characterize Camel Milk products.

The above-described nutritional characteristics may in fact be used for the purposes of defining Camel Milk and Camel Milk products in the context of product standardization. However, the most suitable characteristics to note are the higher content in **β-casein** (around 65%) and **the absence of β-lactoglobulin (a major allergen in bovine milk).**

This latter characteristic is **a key feature that enables the specific identification of Camel Milk products and their distinction from possibly adulterated products**. The only other milk where **β-lactoglobulin** is absent is human milk, the least likely to be used as the source of adulteration of Camel Milk products. These unique compositional features make Camel Milk one of the closest dairy commodities to human milk and make Camel Milk products heavily sought after by consumers. These attributes make Camel Milk products more vulnerable to **adulteration**, primarily through dilution and substitution with bovine milk.

In conclusion, the review of the characteristics of Camel Milk supports the **amenability of these products to standardization** at the global level, based on key characteristics that support determination of authenticity of Camel Milk products.

5. Challenges Faced by the Camel Milk Production Sector

6. Current Standards at the National and Regional Level

At the regional level, the Gulf Cooperation Council (GCC)-Standardization Organization (GSO) adopted a standard for Pasteurized Camel Milk (GSO 1970:2021); raw Camel Milk being included in the GSO raw milk standard (GSO 174:2021).

At the national level, Tunisia standardized raw Camel Milk destined for further processing (NT 14.261:2009). Kenya adopted standards for raw whole Camel Milk (DKS 2061:2016), pasteurized Camel Milk (DKS 2062:2016) and fermented Camel Milk (DKS 2707:2016). Morocco also adopted a national standard for pasteurized Camel Milk (NM 08.4.300:2016). China adopted a standard for powdered Camel Milk (RHB 903—2017) and Kazakhstan adopted in 2015 a standard for Camel Milk processing (ST RK 166-2015) and in 2019 a standard for raw Camel Milk (ST RK 3386-2019).

Table 2 summarizes the international standardization attempts for Camel Milk and select key features included in these standards.

While exploring the international regulatory framework, major producing countries such as Mali and Ethiopia were found to have no national standards for Camel Milk, neither raw nor processed. Among existing standards, there was no specific standard for raw Camel Milk except in Kenya, while some requirements for raw Camel Milk have been included in the general raw milk standards in some countries, such as the Gulf countries and the European Union. Also, the species of Camel has not been specified, with the exception of the GSO and Emirati standards.

Upon reviewing the existing national standards for Camel Milk, the main noticeable difference identified is in the minimum percentage of fat required in pasteurized Camel Milk, especially in the whole milk category, where it ranged from the highest level in the GSO standard (min 3%) to the lowest in the Kenyan standard (min 2%).

The other specifications and requirements in these standards are similar including requirements for drug residues, pesticide residues, and microbial limits, where Codex standards are often stated as the reference.

None of the national standards **currently focusses on authenticity determination** of Camel milk products nor do they address the vulnerabilities associated with fraudulent activities targeting Camel Milk products.

Other efforts of standardization were also reported to be underway under the auspices of the **African Organization for Standardization (ARSO)**.

Table 2: Summary of regional and national standards for Pasteurized Camel Milk.

Criteria		UAE	GSO	Kenya	Morocco
Type of Camel Milk targeted in the standards		▪ Pasteurized Camel Milk ▪ Raw Camel Milk included in raw milk standard	▪ Pasteurized Camel Milk ▪ Raw Camel Milk included in raw milk standard	▪ Raw whole Camel Milk ▪ Pasteurized Camel Milk ▪ Fermented Camel Milk	Pasteurized Camel Milk
Pasteurized Camel Milk standards		▪ UAE.S/GSO 1970 :2010(PCM) ▪ UAE.S GSO 174:2021 (RM)	▪ GSO 1970: 2021 (PCM) ▪ GSO 174:2021 (RM)	▪ DKS 2062: 2016	▪ NM 08.4.300:2016
Scope for pasteurized Camel Milk standards		Pasteurized Camel Milk from *Camelus dromedarius* (Arabian Camels – One hump camel)	Pasteurized Camel Milk from *Camelus dromedarius* (Arabian Camels One hump camel)	Pasteurized Camel Milk from any Kind of Camels (One or Two humps)	Pasteurized Camel Milk from any kind of Camels (One or Two humps)
Summary of compositional requirements for pasteurized Camel Milk					
Milk fat	Whole milk	2.5	3	2	3

(% min)	Low Fat Milk	2-1	3 - 0.5	1	-
	Skimmed Milk	0.5	0.5	0.5	-
Solids not fat (% min)		8	8	6	10
Total acidity (expressed as % of lactic acid), max		0.18 %	0.18 %	0.17 % to 0.21 % (Raw)	0.18 %
Microbiological Limits for pasteurized Camel Milk					
Total Bacterial Count Max. limit		100000 (CFU/ml)	100000 (CFU/ml)	30000 (CFU/ml)	No values
Total Coliform Count Max. limit		10 (CFU/ml)	10 (CFU/ml)	10 (CFU/ml)	No values
European Union (EU)		There is no specific regulation concerning the specifications of Camel Milk. Instead, there are regulations on products of animal origins, under which raw Camel Milk may be placed. (for example, Plate count at 30 °C (per mL) ≤ 1,500,000).			

While Codex standards either developed by the Codex Committee on Milk and Milk Products (CCMMP), such as the standard for Milk Powder or by other relevant horizontal committees such as the Code of Hygienic Practice for Milk and Milk Products (CXC 57-2004) exist and could have some application for Camel Milk products, they need to be considered for possible updates to account for the specificities of Camel Milk.

In particular, the heat sensitivity of Camel Milk and other processing challenges, related to the composition of the product: The differences in protein composition and colloidal structure of Camel Milk from cow's milk, the absence of β-lactoglobulin, the low κ-casein content, high proportion of β-casein, larger casein micelles and smaller fat globules contribute **to the difficulty of making dairy products** from Camel Milk using the same technologies as for bovine milk. Some of the challenges of Camel Milk processing include poor stability of the milk during UHT treatment, impaired rennetability, formation of weak and fragile curd during coagulation, longer fermentation time, and low thermal stability of the milk during drying. These challenges make the **review of existing standards for dairy products, both national and international necessary,** to ensure their suitability.

for Camel Milk production requirements, with the opportunity to develop updates, amendments or new standards, as may be required.

This matter was further emphasized in the scientific literature where, for example Seifu, E., 2023 highlighted that the lack of dedicated guidance for Camel Milk may lead to the adherence to unsuitable pasteurization practices, noting that temperatures above 80°C would cause separation issues in Camel Milk. Konuspayeva et al., 2022 noted the need for regulation that control the Camel Milk products and sales.

7. What Would New Work on Camel Milk Products Under Codex Achieve?

The development of new work under the auspices of the Codex Alimentarius Commission, would consider all avenues to address the specificities of Camel Milk including to adapt guidance available in existing Codex standards and offer the development of new standards, as deemed necessary. Of particular interest, a standard that would enable to guarantee the authenticity of Camel Milk products and protect these products from adulteration and fraud practices, often resulting from international trade.

Similarly, existing standards on hygienic practices related to Camel Milk would be reviewed and updated to account for the specificities of Camel Milk commodities.

This work will pursue the ultimate goal to help harmonize Camel Milk production conditions, where needed, and will reflect positively on the global trade of Camel Milk products.

Efforts of standardization would also account for the diversity in regional practices, resulting from geography (spanning from African countries such as Kenya, Mali, Somalia, and Ethiopia, through the Eastern

Mediterranean and GCC countries such as the United Arab Emirates and Saudi Arabia, reaching Asia, North America and the South-West Pacific), seasonality, species and other variations.

Efforts will be made to ensure any updates to existing standards, or the development of new provisions apply equally to Camel Milk originating from the species *Camelus dromedarius* (one-humped) and/or *Camelus bactrianus* (Two-humped) camels.

Up-to-date guidance from Codex on conditions of production and determination of authenticity of Camel Milk products will undoubtedly contribute to protect consumers and help ensure that manufacturers apply adapted best practices in dairy production, enable a larger proportion of the Camel Milk products to enter the formal global trade process and encourage small scale producers to contribute to the Camel Milk supply chain.

This work being mainly focused on quality characteristics of Camel Milk products would be carried under the oversight of the Codex Committee on Milk and Milk Products (CCMMP).

The outputs of the new work proposed would consist in proposed updates to existing standards of CCMMP, and the proposal of a new standard that would address the specificities of Camel Milk products with an emphasis on authenticity. Aspects related to hygienic practices, presence of contaminants, labelling, and methods of analysis and sampling will be considered in accordance with the standards developed by the relevant Codex horizontal committees.

Charting this path forward of Codex work associated with Camel Milk products would be carried out in conjunction with the current efforts underway by the CCRVDF to progress in the development of dedicated Maximum Residue Levels (MRLs) for veterinary drugs in Camelid tissues, including to explore the application of the extrapolation approach and other avenues to derive such MRLs. This work was initiated subsequent to a proposal developed and tabled by Jordan, Morocco, AIDMSO and IUFoST at CCRVDF26.

8. Alignment of the Proposed New Work with Codex New Work Priorities and Codex Strategic Directions

This paper offers to demonstrate the need for more guidance and support afforded the Camel Milk Production Sector enabling its further development and more effective contribution to the relevant country economies where this sector is prevalent.

Initiating New Work under Codex for Camel Milk Products would reignite the interest in such products and, upon the conclusion of the review and development of relevant updates and/or new standards, would lead to:

- Standardized approaches for Camel Milk authenticity checks helping to prevent incidents of adulteration and fraud,
- Enhanced conditions of production of Camel Milk products,
- Enabling more producers from the informal production sector access to access formal domestic and international trade, with a higher value addition,
- Reduction of waste and loss as a result of compliance with enhanced food safety and quality guidance applied to a larger production scale in the different producing countries impacted,
- Increased income for Camel Milk producers, most of which are in developing countries, resulting from the improvement of food safety and quality of Camel Milk products developed in accordance with the updated guidance.

The proposed new work and its expected outputs meet the criteria outlined in the Strategic Plan 2020-2025 of the Codex Alimentarius Commission with specific alignment with:

- **Goal 2** – Develop standards based on science and Codex risk-analysis principles. In particular, 2.1. Use scientific advice consistently in line with Codex risk analysis principles. The proposed standard, its rationale and its development will be based on existing evidence and data gathered.
- **Goal 3** – Increase impact through the recognition and use of Codex standards. In particular, 3.3. recognize and promote the use and impact of Codex standards.

  The proposed standard responds to a clear need expressed by the production sector to support authenticity determination for Camel Milk product. It will also address the need for more consistent and public guidance to producers of Camel Milk, such that they can benefit from the various product development and market access opportunities, leading to higher value and therefore to better economic and social prospects which can be tangibly attributed as impacts of the projected standard.
- **Goals 1 and 3**: Relevance of standards to members: This will address the need to promote a commodity that has impacts on rural communities, contribute to

- reduction of wastage, support adding value to a commodity produced mainly in developing countries, hence reduce hunger hand improve earning potential.

In conclusion, the development of the proposed new work under Codex with the scope identified above holds significant benefits by ensuring global harmonization, enhancing consumer protection, supporting improved production and technology development, reducing waste, and facilitating trade.

9. Proposed New Codex Activities and Next Steps

To move forward, it is proposed that an Electronic Working Group be created under the auspices of CCMMP with the tasks to:

- Review Current Codex Standards under CCMMP that may be applicable to Camel Milk products and identify areas that should be updated or enhanced.
- Review and make recommendations for updates of other Codex standards developed by horizontal committees with possible implications on Camel Milk Products including:
    - The Code of Hygienic Practice for Milk and Milk Products (CXC 57-2004),
    - Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods (CXG 21-1997),
    - General Standard for Contaminants and Toxins in Foods and Feeds (CXS 193- 1995), and
    - General Principles of Food Hygiene (CXC 1-1969)
    - Recommended methods of Analysis and Sampling (CXS 234-1999)
- Develop a new standard for Camel Milk products, where relevant, to account for their specificities with emphasis on the most traded products, such as Camel Milk Powder and other products offering an important development potential, for example: Liquid Pasteurized Camel Milk. The focus should be on developing a **standard of authenticity** enabling attestation to the legitimacy of products derived from Camel Milk.

This EWG would report to CCMMP working by correspondence.

A physical meeting of the EWG, hosted by the United Arab Emirates, candidate to co-chair the EWG would be envisaged to support engagement with Codex members and observers. Such meeting would be organized using a hybrid format to maximize participation of Codex members, particularly developing countries, offering interpretation to a larger number of Codex languages as may be required, such as the inclusion of Arabic. Upon confirmation by CCMMP (working by correspondence) of the readiness of the proposed standard for adoption, it would be forwarded to the Commission for consideration of such adoption.

While the proposed path forward described above is the most sought after approach by the authors of this discussion paper, including the members and observers consulted in this process, the **most immediate ask** submitted for the consideration of the Codex Alimentarius Commission at its 47th Session is the creation of an Electronic Working Group under CCMMP, working by correspondence, which would guide further action for standardization of Camel Milk products, including a **standard of authenticity** for Camel Milk products within Codex as well as enhanced guidance for their conditions of production and characterization.

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PROJECT DOCUMENT ON THE DEVELOPMENT OF A STANDARD ON

ON CAMEL MILK PRODUCTS

1. Purpose and scope of the standard

The purpose of this work is to develop an international standard for Camel Milk products, to account for their specificities as dairy products, with emphasis on developing a standard of **authenticity** to **prevent adulteration** of products derived from Camel Milk.

The proposed Standard would also include **guidance on conditions of production** of Camel Milk products, that are applicable to these products by **referring to** the relevant Codex texts such as those developed by CCMMP (e.g., STANDARD FOR MILK POWDERS AND CREAM POWDER CXS 207-1999) and those developed by other horizontal committees (e.g., Code of Hygienic Practice for Milk and Milk Products CXC 57-2004).

The proposed standard would **identify any important deviations** from the current guidance included in the referred Codex standards as a result of the **distinct characteristics** of Camel Milk products, in comparison with other dairy products.

The Standard would apply to Camel Milk products intended for human consumption, i.e., ready for their intended use as human food for direct consumption or for further processing. The Standard would apply to the most traded products, such as Powder Camel Milk or Pasteurized Camel Milk or any other products offering an important development potential.

The standard will aim to address Camel Milk products derived from the species Camelus *dromedarius* (one-humped) or *Camelus bactrianus* (two-humped) camels.

One of the objectives pursued from this standard is to have a **single "Codex reference standard"** for Camel Milk products, referring to or based upon Codex texts with the relevant changes that encompasses:

- Authenticity criteria
- the essential safety, quality, testing methods, and labelling requirements to safeguard consumer health and uphold fair practices in the food trade.

The standard will aim to enhance consumer confidence in Camel Milk products by ensuring that they meet established authenticity, safety and quality requirements.

Product definition

This section would focus on providing **reference guidance** on the attestation of **authenticity of Camel Milk Products**, by providing clear guidance on what would distinguish these products from other dairy products.

It is suggested that this section refers to the **absence of β-lactoglobulin,** as the main defining factor of such products in comparison with other dairy products, enabling a **decisive authenticity determination criterion** for producers and consumers.

The standard will aim to be applicable to Camel Milk products derived from camel milk from the species Camelus *dromedarius* (one-humped) or *Camelus bactrianus* (two-humped) camels.

2. Relevance and timeliness

The production, trade and consumption of Camel Milk Products are in continued increase reaching 4,116,669 tons in 2022, (FAO STAT 2023[3]), with a diversity of countries involved in such production, including Kenya Somalia, Pakistan, Mali, Ethiopia, Saudi Arabia, Niger, Uzbekistan, China and the United Arab Emirates. Although still dominated by informal activities between producers and consumers, in some large producing countries e.g., Kenya and Saudi Arabia, the trade of Camel Milk products has evolved to include a wide variety of products such as Pasteurized Camel Milk, Condensed UHT Camel Milk,

Camel Butter, Camel Milk Cheese, Camel Milk Yoghurt, Camel Milk Powder, Camel Milk Ice Cream, and Dried Milk Chocolate.

Exports of Camel Milk products go beyond producing countries and include countries of the European Union, China and the United States of America.

The increasing interest in Camel Milk products has led to multiple attempts of documented adulteration, where Camel Milk powder was reported[4] to be diluted with bovine milk powder at export markets, prior to be being

[3] FAO STAT (2023). https://www.fao.org/faostat/en/#data/QCL

[4] Industry Input during the International Symposium on Camel Milk Products hosted by the United Arab Emirates from 24-25 September 2024.

used in several product formulations. Such fraud attempts if not adequately prevented and mitigated can undermine the development of this production sector, by threatening the integrity of the supply chain of Camel Milk products.

The United Nations has designated 2024 as the International Year of Camelids (IYC 2024) to spotlight "the overlooked potential of camelids and their contribution to food and nutrition security, economic growth as well as socio-cultural heritage across more than 90 countries."

Developing the Camel Milk production sector, with added guidance to producers and improved value-addition that may result from their primary products will translate in improved livelihoods of millions of individuals and contribute to the overall economic and human development[5].

The development of the sector would also contribute to a reduction of possible food loss, resulting from shortcomings in production conditions, within the largest producing countries**Error! Bookmark not defined.**.

The United Arab Emirates (UAE) championed attempts to create momentum supporting the standardization of Camel Milk products within Codex with the introduction of proposals

in this vein, the latest of which was reported at the 11th session of the Codex Committee for the Near East (CCNE11), which was held at FAO Headquarters, Rome, Italy, from 18 September to 22 September 2023.

The UAE also hosted the International Symposium on Camel Milk Products from 24-25 September 2024, as part of its contribution to IYC2024 where international experts discussed the current development in Camel Milk products and their potential, along with needs in product standardization.

The momentum created by these initiatives, the immediate needs of product standardization uncovered and expressed by the Camel Milk production sector**Error! Bookmark not defined.**, along with the potential of the contribution of Camel Milk products to food security and the sustainable development goals offer a good justification for the timeliness and the relevance of this proposal of new work on a Codex international standard addressing Camel Milk products.

3. Main aspects to be covered

The proposed new standard would primarily focus on the determination of **authenticity** of Camel Milk Products, based on their unique composition characteristics in comparison with other dairy products. The **absence of β-lactoglobulin, would likely be used as** the main defining factor of such products, enabling the determination of authenticity of these products for producers and consumers.

The standard would aim to represent a **single "Codex reference standard"** for Camel Milk products, referring to or based upon Codex texts with the changes to account for the technological characteristics of Camel Milk products. The standard would encompass:

- Authenticity criteria
- the essential safety, quality, testing methods, and labelling requirements to safeguard consumer health and uphold fair practices in the food trade.

It would include a repository of **guidance on conditions of production** of Camel Milk products, **referring to** the relevant Codex texts such as those developed by CCMMP (e.g., STANDARD FOR MILK POWDERS AND CREAM POWDER CXS 207-1999) and those developed by other horizontal committees (e.g., Code of Hygienic Practice for Milk and Milk Products CXC 57-2004), with the identification of the needed deviations as a result of the distinct characteristics of Camel Milk, in comparison with other dairy products.

Where needed methods of analysis and sampling would be recommended to support any specific characteristics of these products, particularly for **authenticity testing**.

4. Assessment against the criteria for the establishment of work priorities

The following criteria were found to be relevant for the development of the Standard related to Camel Milk Products.

a- Consumer protection from the point of view of health and fraudulent practices:

- A standard that specifies clear authenticity criteria for Camel Milk products would deter and contribute to prevent the current fraudulent activities targeting these products and associated with their increased economic value. The standard would not only support the definition of such criteria but also the provision of guidance on how to ascertain their fulfilment, such as the identification of the relevant method(s) of analysis:

[5] Seifu, E. 2023. Camel Milk products: innovations, limitations and opportunities. *Food Production, Processing and Nutrition 5:*15. https://doi.org/10.1186/s43014-023-00130-7

*Camel Milk and Camel Milk products are distinguished from other dairy products by a higher content in **β-casein** (around 65%) and **the absence of β-lactoglobulin (a major allergen in bovine milk).***

*This latter characteristic is **a key feature that enables the specific identification of Camel Milk products and their distinction from possibly adulterated products**. The only other milk where **β-lactoglobulin** is absent is human milk, the least likely to be used as the source of adulteration of Camel Milk products. These unique compositional features make Camel Milk one of the closest dairy commodities to human milk and make Camel Milk products heavily*

*sought after by consumers. These attributes make Camel Milk products more vulnerable to **adulteration**, primarily through dilution and substitution with bovine milk.*

*Due to its distinctive characteristics, Camel Milk is **more expensive** than cow milk, reaching 3 times the price per unit. Diluting Camel Milk with Cow Milk has been a practice reported on the market for illicit gain. The development of a standard for Camel Milk products would help prevent acts of fraud, which is consistent with the objectives of Codex to prevent such fraudulent practices.*

- A standard for Camel Milk products that offers a repository of guidance on the applicability of Codex guidelines related to dairy products, with the identification of the relevant deviations considering the specificities of Camel Milk would contribute to more consistent application of safety and quality requirements, resulting in **enhanced consumer health protection**:

  *The heat sensitivity of Camel Milk, the differences in protein composition and colloidal structure with cow's milk, the absence of β-lactoglobulin, the low κ-casein content, high proportion of β-casein, leading to larger casein micelles and smaller fat globules contribute **to the difficulty of making dairy products**.*

  Some of the challenges of Camel Milk processing include poor stability of the milk during UHT treatment, formation of weak and fragile curd during coagulation, longer fermentation time, and low thermal stability of the milk during drying. Some reports[Error! Bookmark not defined.] highlighted that the lack of dedicated guidance for Camel Milk may lead to the adherence to unsuitable pasteurization practices, noting that temperatures above 80°C would cause separation issues in Camel Milk.

b- Volume of production and consumption in individual countries and volume and pattern of trade between countries

The Food and Agriculture Organization (FAO) issued statistics of camel milk from 1961 until 2022. Since 1961, the annual growth in camel milk production is estimated to 6.5% (Konuspayeva et al., 2023).

According to FAOSTAT[Error! Bookmark not defined.], Kenya is the leading producer of raw camel milk in the world, followed by Somalia, Pakistan, Mali, Ethiopia, Saudi Arabia, Niger, and the United Arab

Emirates. In 2022, global camel milk production reached 4,116,669 tons. From 2014 to 2022, global camel milk production has consistently increased by 0.83%, rising from 3,430,675 tons to 4,116,669 tons.

Table 1 presents the production of raw camel milk for the top-producing countries in 2022.

From 2016 to 2022, the total production of raw camel milk has remained consistent. Kenya leads the production with a cumulative total of 6,878,575.14 tons over the 7-year period, followed by Somalia and Pakistan. Other countries producing lesser amounts include Mali, Ethiopia, Saudi Arabia, Niger, and the United Arab Emirates.

Table 1: Raw Camel Milk Production during the year 2022 (in tons) (FAO STAT,2022)

Country	Production (tonnes)
Kenya	*1,096,698*
Somalia	*987,842.9*
Pakistan	*944,000*
Mali	*294,248.6*
Ethiopia	*220,446*
Saudi Arabia	*135540*
Niger	*106,597.4*
United Arab Emirates	*79,434.44*

In addition, fermented Camel Milk is significantly produced in some Asian countries (Kyrgyzstan, Russia, and Uzbekistan) where it is known under the name of “Shubat”. France is also reported to produce the “Bosse de Fagnes” cheese, a Camel Milk Cheese, which is traded nationally and exported to other EU countries.

Experts and representatives of the production sector that gathered at the International Symposium on Camel Milk Products[Error! Bookmark not defined.] reported the production of Pasteurized Camel Milk in the United Arab Emirates exceeds 7,000 tons annually, where 1,800 tons are reported to be exported to the European Union, China and the United States of America. The remainder is consumed locally or traded within the Near-East region.

c- Diversification of national legislations and apparent resultant or potential impediments to international trade

The international standard-setting landscape already encompasses several standards developed nationally and regionally.

At the regional level, the Gulf Cooperation Council (GCC)-Standardization Organization (GSO) adopted a standard for Pasteurized Camel Milk (GSO 1970:2021); raw Camel Milk being included in the GSO raw milk standard (GSO 174:2021).

At national levels, Tunisia standardized raw Camel Milk destined for further processing (NT 14.261:2009). Kenya adopted standards for raw whole Camel Milk (DKS 2061:2016), pasteurized Camel Milk (DKS 2062:2016) and fermented Camel Milk (DKS 2707:2016). Morocco also adopted a national standard for pasteurized Camel Milk (NM 08.4.300:2016). China adopted a standard for powder Camel Milk (RHB 903—2017) and Kazakhstan adopted in 2015 a standard for Camel Milk processing (ST RK 166-2015) and in 2019 a standard for raw Camel Milk (ST RK 3386-2019).

Table 2 summarizes the international standardization attempts for Camel Milk and select key features included in these standards.

While exploring the international regulatory framework, major producing countries such as Mali and Ethiopia were found to have no national standards for Camel Milk, neither raw nor processed. Among existing standards, there was no specific standard for raw Camel Milk except in Kenya, while some requirements for raw Camel Milk have been included in the general raw milk standards in some countries, such as the Gulf countries and the European Union. Also, the species of Camel has not been specified, with the exception of the GSO and Emirati standards.

The main noticeable difference was in the minimum percentage of fat required in pasteurized Camel Milk, especially in the whole milk category, where it ranged from the highest level in the GSO standard (min 3%) to the lowest in the Kenyan standard (min 2%).

The other specifications and requirements in these standards are similar including requirements for drug residues, pesticide residues, and microbial limits, where Codex standards are often stated as the reference.

None of the national standards **currently focusses on authenticity determination** of Camel milk products nor do they address the vulnerabilities associated with fraudulent activities targeting Camel Milk products.

Table 2: Summary of regional and national standards for Pasteurized Camel Milk.

Criteria	UAE	GSO	Kenya	Morocco
Type of Camel Milk targeted in the standards	▪ Pasteurized Camel Milk ▪ Raw Camel Milk included in raw milk standard	▪ Pasteurized Camel Milk ▪ Raw Camel Milk included in raw milk standard	▪ Raw whole Camel Milk ▪ Pasteurized Camel Milk ▪ Fermented Camel Milk	Pasteurized Camel Milk
Pasteurized Camel Milk standards	▪ UAE.S/GSO 1970 :2010(PCM) ▪ UAE.S GSO 174:2021 (RM)	▪ GSO 1970: 2021 (PCM) ▪ GSO 174:2021 (RM)	▪ DKS 2062: 2016	▪ NM 08.4.300:2016

Scope for pasteurized Camel Milk standards		Pasteurized Camel Milk from *Camelus dromedarius* (Arabian Camels – One hump camel)	Pasteurized Camel Milk from *Camelus dromedarius* (Arabian Camels One hump camel)	Pasteurized Camel Milk from any Kind of Camels (One or Two humps)	Pasteurized Camel Milk from any kind of Camels (One or Two humps)
Summary of compositional requirements for pasteurized Camel Milk					
Milk fat (% min)	Whole milk	2.5	3	2	3
	Low Fat Milk	2-1	3 - 0.5	1	-
	Skimmed Milk	0.5	0.5	0.5	-
Solids not fat (% min)		8	8	6	10
Total acidity (expressed as % of lactic acid), max		0.18 %	0.18 %	0.17 % to 0.21 % (Raw)	0.18 %
Microbiological Limits for pasteurized Camel Milk					
Total Bacterial Count Max. limit		100000 (CFU/ml)	100000 (CFU/ml)	30000 (CFU/ml)	No values
Total Coliform Count Max. limit		10 (CFU/ml)	10 (CFU/ml)	10 (CFU/ml)	No values
European Union (EU)		There is no specific regulation concerning the specifications of Camel Milk. Instead, there are regulations on products of animal origins, under which raw Camel Milk may be placed. (for example, Plate count at 30 °C (per mL) ≤ 1,500,000).			

d- **International or regional market potential**

In Kenya, as well as in other key Camel Milk producing countries such as Saudi Arabia, the Camel Milk sector has been dominated by informal trade in both volume and number of stakeholders involved[6]. However, increased efforts of industrialization of Camel Milk production have led to the development of a wide variety of products, including fresh pasteurized milk, flavored milk, milk powder, ghee, drinking yoghurt, cheese, butter and ice cream. Pasteurized Camel Milk produced in the United Arab Emirates (UAE) is regularly sold across the country in many of the product forms described above and is also exported worldwide, with markets extending to China, the European Union and the United States[Error! Bookmark not defined.].

Overall, Camel Milk powder was in fact reported to be the form of Camel Milk that **is the most produced and traded internationally**, including in Central Asia. The industrial zone of Turkestan in Kazakhstan alone is reported to produce more than 200 tons of dry Camel Milk, which is exported to China, Macau, and Hong Kong[7].

Infant formula produced from Camel Milk is another high value processed product of great interest, with its unique compositional attributes related to the absence of **β-lactoglobulin** which contributes to making this breast milk substitute much closer to human milk.

The anticipated outcome of the new standard is to foster guidance for Camel Milk producers, leading to their access to evidence-based production conditions based upon-Codex guidance with the relevant updates. This will in turn translate in higher value products and the increase of the global trade of Camel Milk products,

[6] Musinga, M., Kimenye, D., Kivolonzi, P., 2008. The Camel Milk Industry in Kenya. Resource Mobilization Center.
[7] https://dairynews.today/global/news/camel-milk-powder-from-turkestan-region-is-exported-to-china-macau-and-hong-kong.html Accessed on October 25th, 2024

thereby making a positive contribution to both regional and international trade with positive impact on the economies and societies of several developing countries in Africa and Asia.

e- Amenability of the commodity to standardization

Camel Milk products exhibit unique attributes in their composition, particularly concerning proteins, lipids, vitamins, and minerals. Additionally, this high-value commodity is recognized for its possible nutraceutical properties for example of lactoferrin, Immunoglobulins, α-lactalbumin and serum albumin, making it subject to informal trading and therefore more susceptible to adulteration.

While differences exist in the composition of Camel Milk and Camel Milk products as a result of species variations as well as the diversity of the geographic areas where Camels are raised, **it is possible to establish general trends for levels of key macronutrients that characterize Camel Milk products**.

The most suitable characteristics that tend to characterize Camel Milk products are related to the higher content in **β-casein** (around 65%) and **the absence of β-lactoglobulin (a major allergen in bovine milk).**

This latter characteristic is **a key feature that enables the specific identification of Camel Milk products and their distinction from possibly adulterated products**. The only other milk where **β-lactoglobulin** is absent is human milk, the least likely to be used as the source of adulteration of Camel Milk products.

A review of the characteristics of Camel Milk products[8] supports the **amenability of these products to standardization** at the global level, based on key characteristics that support determination of authenticity of Camel Milk products.

Specifying some characteristics that support the prevention of fraud as well as offering more guidance on conditions of production and commercialization through the adaptation of Codex horizontal standards to this commodity such as hygiene standards, packaging and labeling, will help establish better controlled conditions of production and trade of this product.

f- Coverage of the main consumer protection and trade issues by existing or proposed general standards.

While horizontal codex standards and general codex milk and milk products requirements may apply to Camel Milk products, a standard for authenticity of these products is required to help prevent fraud targeting these commodities.

A proposed standard for Camel Milk products would also help consolidate various safety and quality requirements by referencing the relevant codex texts that apply to these products, while highlighting the deviations that need to be observed for technological reasons, offering improved guidance to producers and traders.

g- Number of commodities which would need separate standards indicating whether raw, semi-processed or processed.

The authenticity standard would apply to all products derived from Camel Milk, as may be relevant.

The projected guidance on production conditions referring to existing Codex texts and identifying deviations that need to observed will be proposed for the most traded Camel Milk products which require such guidance as a result of the technological challenges identified e.g., inadequacy of temperatures of sterilization and other treatments of dairy products related to the unique composition characteristics.

h- Work already undertaken by other international organizations in this field.

No standard of global relevance was identified for this commodity. However, regional inter-governmental organizations such as GCC Standardization Organization (GSO) have established a standard for Pasteurized Camel Milk i.e., GSO 1970:2009 Dairy and Dairy Products- Pasteurized Camel Milk. Other efforts of standardization were also reported to be underway under the auspices of the **African Organization for Standardization (ARSO)**.

5. Relevance to Codex strategic objectives

As can be concluded from the information presented above, the proposed standard meets the criteria outlined in the Codex Strategic Plan 2020-2025 of the Codex Alimentarius Commission:

Goal 2 – Develop standards based on science and Codex risk-analysis principles. In particular, 2.1. Use scientific advice consistently in line with Codex risk analysis principles. The proposed standard, its rationale and its development will be based on existing evidence and data gathered.

[8] Discussion paper introduced for consideration by the 47th Session of the Codex Alimentarius Commission on New Work on Camel Milk Products Standard.

Goal 3 – Increase impact through the recognition and use of Codex standards. In particular, 3.3. Recognize and promote the use and impact of Codex standards.

The proposed standard responds to a **clear need** expressed by the production sector to support authenticity determination for Camel Milk product. It will also address the need for more consistent and public guidance to producers of Camel Milk, such that they can benefit from the various product development and market access opportunities, leading to higher value and therefore to better economic and social prospects which can be tangibly attributed as impacts of the projected standard.

Goals 1 and 3: Relevance of standards to members – As described under the justification of alignment with Goal 3, the proposed standard development responds to a clear need expressed by the production sector and food regulators of producing countries alike.

Promoting better guidance for conditions of production and authenticity determination of Camel Milk products, will result in clear impacts on rural communities and contribute to reduction of documented product loss and waste as **a result of inadequate observance of the relevant conditions of production**. This will further support objectives of food security and reduction of poverty.

The development of this standard is also in direct alignment with the goals expressed by the designation of 2024 as the International Year of Camelids. The development and promulgation of this standard will help raise awareness about the importance and contributions of Camelids to the livelihoods of people. Camels, as a milk and meat producing species are an important source of livelihood for millions of families - most of them pastoralists - in dryland and mountainous rangeland ecosystems around the world.

6. Information on the relationship between the proposal and other existing Codex documents

This proposed new international standard has no relation to any other existing Codex text, except that this standard will refer to relevant horizontal standards and related texts developed by General Subject Committees and the Committee on Milk and Milk Products (CMMP) as follows:

- General Standard for Contaminants and Toxins in Foods and Feeds (CXS 193- 1995).
- General Principles of Food Hygiene (CXC 1-1969)
- Code of Hygienic Practice for Milk and Milk Products (CXC 57-2004)
- Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods (CXG 21-1997).
- General Standard for the Labelling of Pre-packaged Foods (CXS 1-1985)
- General Standard for the Use of Dairy Terms (CXS 206-1999)
- Recommended Methods of Analysis and Sampling (CXS 234-1999)

7. Identification of any requirement for and availability of expert scientific advice.

No provision for scientific advice is foreseen at this stage.

Data is available in the public domain.

No safety issue requires international scientific guidance by Codex Advisory bodies.

8. Identification of any need for technical input to the standard from external bodies so that this can be planned for the proposed timeline for completion of the new work.

Input will be needed from inter-governmental organizations such as regional standardization organizations (e.g., ARSO, GSO) and other non-governmental organizations, with stake in the development of the standard, such as the International

Dairy Federation (IDF) and the International Union of Food Science and Technology (IUFoST). These organizations have an observer status with Codex and would therefore be included in the standard elaboration process.

9. Proposed approach and timelines for completion of work

It is proposed that an Electronic Working Group (EWG) reporting to CCMMP be established to confirm the current scoping of the work and initiate the drafting process of the proposed standard.

This EWG would report to CCMMP working by correspondence.

A physical meeting of the EWG, hosted by the United Arab Emirates, candidate to co-chair the EWG would be envisaged to support engagement with Codex members and observers. Such meeting would be organized using a hybrid format to maximize participation of Codex members, particularly developing

countries, offering interpretation to a larger number of Codex languages as may be required, such as the inclusion of Arabic.

Upon confirmation by CCMMP (working by correspondence) of the readiness of the proposed standard for adoption, it would be forwarded to the Commission for consideration of such adoption.

Step	Tentative Date
Approval of the Establishment of an Electronic Working Group (EWG) tasked to review the existing codex standards and developing new standard for camel milk commodity and its Establishment.	November 2024
Further Scoping of the Standard through the established electronic working Group (EWG) and Initial Drafting of the Proposed Standard	January - 2025
Physical Meeting of the EWG in the UAE and reporting to the CCMMP working by correspondence	Between May and Sept 2025
Update of Progress to the CAC48	November 2025
Continued Work of the EWG (to be re-established based on CAC48 advice upon recommendation by CCMMP) and reporting to CCMMP working by correspondence	January 2025 to June 2026
Potential Adoption by CAC49	July 2026