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Towards a science history of Jordan's dairy industries. The example of jameed

PAR ÉLISE TANCOIGNE · PUBLIÉ 7 SEPTEMBRE 2021 · MIS À JOUR 8 SEPTEMBRE 2021

Though Jordan is not a big producer of dairy products, its dairy tradition is among the oldest in the world (Curry 2013) and dairy products are an important and integrated part of the Jordanian diet. The main products processed and consumed in the country today are fresh cow, sheep and goat milk, drinking yoghurt (shaneeneh, شنية), strained yoghurt (labneh, لبنه), dried yoghurt (jameed, جميد, see picture above) and clarified butter (samneh, سمنة). Two types of cheese are also produced: soft white and boiled cheeses, but they represent the smallest part of the production. The milk mostly comes from cows (75 %), with sheep and goats accounting for 22 % and 3 % respectively. About 95 % of the milk produced in the country is collected and processed in dedicated processing units (Alqaisi *et al.* 2010).

Formal and informal industries

The industry is two-sided: on the one hand, the cattle industry concentrates most of the development efforts initiated by the State in the 1970s, through the importation of new cattle breeds and the development of huge processing plants (Alqaisi *et al.* 2010). Imported breeds now account for 88 % of cattle while local breeds represent 12 %, mostly raised in small herds (<10 heads) (Alhammd 2020). On the other hand, another industry based on small ruminants (sheep and goats) relies on local breeds and processes milk in small- or medium-scale workshops. One example of a local breed is the Awassi sheep, with its three *baladi*, *saqri* and *naemi* strains (Al-Atiyat *et al.* 2021). The manufacturing practices based on sheep and goat's milk are supported by international development aid, for instance from the US (USAID LENS 2017) as well as from Europe

(Ambassade de France 2018), dedicated to both Jordanian citizens and to refugees. This dichotomy in the industry is visible in Figure 1, which shows how herd sizes, milk production and yield (the amount of milk produced per animal) have increased since the 1960s. Since the end of the 1980s, the production of cow's milk has increased steadily to 30 times its initial level. However, the number of animals has not increased much in that period, unlike the yield, which points to genetic selection and the importation of cows producing high quantities of milk. Jordan put a ban on cattle imports in 2018 so as to regulate the milk market (MENAFN 2020). On the other hand, the production of sheep's milk increased only sevenfold, with huge variations mostly explained by variations in the number of available animals and not by an increase in yield. Goat milk production doubled over the same years, which is remarkably low in comparison to the rate of growth of the other species. As goat and sheep herding is free-range, it is much more sensitive to droughts and diseases than cattle breeding, hence the numerous variations observed in Figure 1.

The country today counts 10 large and 230 small dairy plants processing cow's milk (Alhammd 2020). The first dairy factory established in 1968 was that of the Jordanian Dairy Company, which ranks among the top three companies processing milk in Jordan, alongside Hammoudeh dairy (established in 1987) and the Danish Jordanian dairy (established in 1980) (Alqaisi *et al.* 2009). All of them are integrated farms: they own both a herd (more than 3,000 cows each) and a dairy plant. There are no figures for the number of sheep and goat dairy farms and dairy plants (Alqaisi *et al.* 2009).

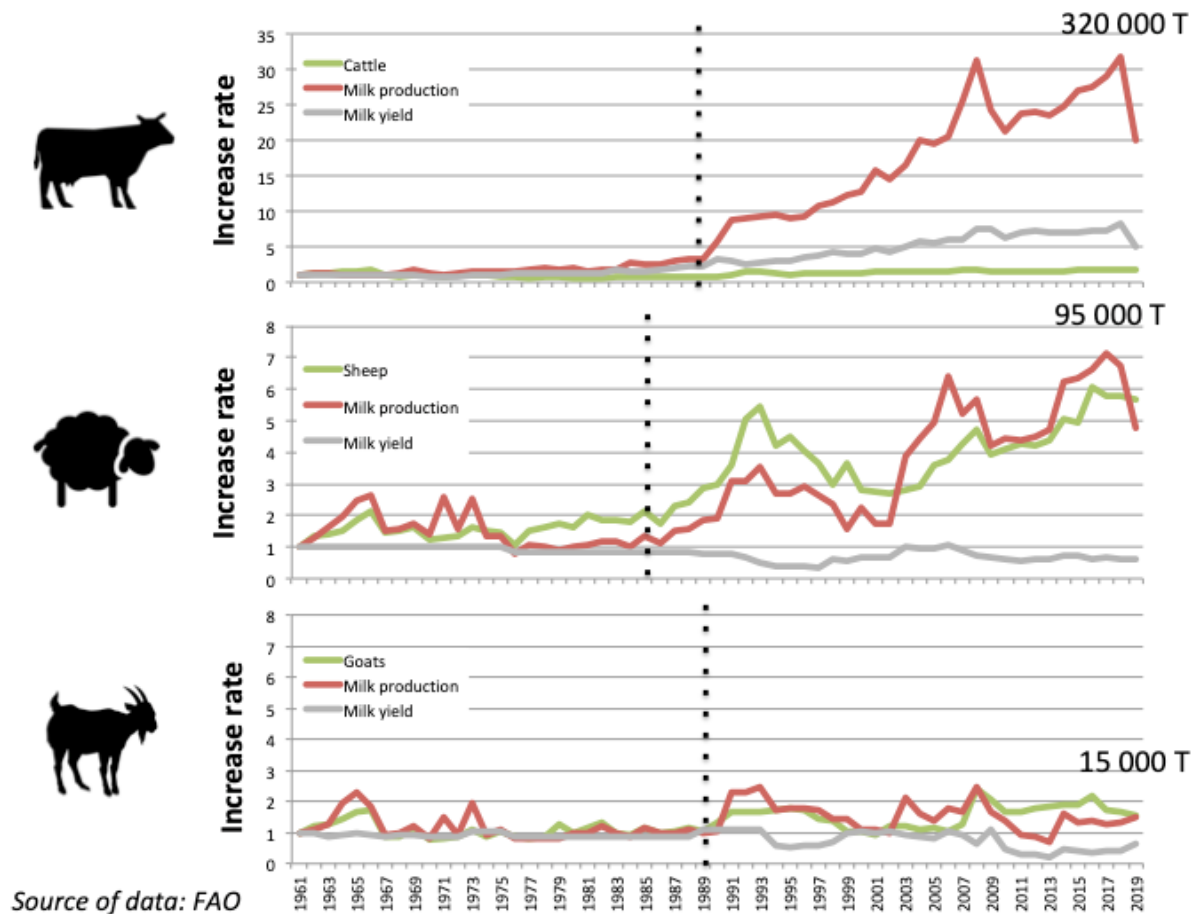


Figure 1: Growth rate of living animals (green), milk production (red) and milk yield (grey) for three milking species in Jordan (1961-2019). Dotted lines indicate the start of the steady increase in milk production. Graphs compiled by the author with data from the FAO.

Little literature is available on the history of Jordan's dairy industry, despite the huge changes it has experienced in the last 30 years. In this blog post, I would like to present some of the questions that I find interesting to raise in order to start writing such a history. From a history of science perspective, I am keen to look at the making of science-based standards and norms and to study the role of expertise in establishing and growing this industry. I rely for this on two months of fieldwork that I did in January 2019 and between April and May 2021 in one of the most symbolic of the dairy industries: the jameed industry.

Jameed?

Jameed remains little known outside Jordan and is exported mostly to the Gulf countries and the U.S.A., where most of the Jordanian diaspora lives. It is a dried and salted yoghurt that, along with *samneh*, used to be produced by Bedouin and village women (Shunnaq *et al.* 2021). Both can be seen as a means of preserving the fat and the proteins of sheep and goat milk beyond the milking season, which usually lasts from February to June or July. Jameed is traditionally shaped into

cones that are dried until they become hard. Drying was traditionally done on the top of tents (Palmer 2002). It takes around 6 to 10 days and 12 litres of milk to produce 1 kg of jameed (interview, jameed producer, April 17, 2021). Its very low level of moisture, its high acidity and salt content give it a 2-year home shelf life. After soaking, jameed is mostly used to prepare *mansaf* (منسف), the national dish of Jordan which consists of rice, mutton and bread, but it also features in other dishes. Other uses include drinking it as a beverage, or eating it as snack.

Jameed is particularly interesting as it plays a really important role in Jordanian culture, as part of the *mansaf* dish, which is a key element at feasting events in Jordan (Shunnaq et al. 2021). *Mansaf* was proclaimed as the national dish after the 1960s, as part of the building of the nation-state and the Jordanian identity (Massad 2001). Clues that jameed also came to be considered as part of Jordanian identity during this process can be found in different places, such as marketing ads and clothing (see Figure 2).



Figure 2. Left: Ad for a brand selling jameed, posted on the brand's Facebook page, February 7, 2021. Right: ad for a T-shirt produced by a Jordanian brand, posted on the brand's Twitter account, November 24, 2015

Figure 2 (left) is an ad from a brand selling jameed, which displays a cone of jameed wrapped in a Jordanian shemagh, under the title “jameed ballad” [literally “jameed from the country” or “local jameed”].

Figure 2 (right) is an ad for a T-shirt sold by a Jordanian brand of clothes. Mirroring a scene from the movie *300* where the King of the Spartans pushes the Persian messenger asking for his submission into a deep well (“This is Sparta!”), the T-shirt similarly portrays a jameed cone kicking a hamburger while shouting “This is Jordan!” In this picture, jameed represents Jordan in a fight that can be interpreted as a fight

against American imperialism.

However traditional the portrayal of jameed may be, the jameed industry has undergone several important changes since the end of the 1980s. I find these especially interesting to enquire into, from a sociological and historical science study perspective. I will focus on three of them: 1/ the diversification of jameed products, 2/ the extension of its area of production, 3/ the use of pasteurization as a means of controlling the production process.

1001 Jameeds. What does “Jameed” stand for?

Many jameed cones found on the market are home-made products and are part of the informal market and sold by word of mouth. Attempts to scaleup jameed production started at the end of the 1980s, as stated in the first article to be published about the study of jameed's chemical composition:

*“This investigation was the first attempt to define the product and to establish the conditions under which it is manufactured, **with the aim of encouraging the local authorities to start manufacturing the product on a commercial scale**”* (Abu-Lehia 1988)

A new shape of jameed was introduced to the market by one of the leading food businesses in Jordan at the end of the 1990s, quickly followed by many competitors: liquid jameed (Figure 3). Liquid jameed are extremely heterogeneous when it comes to their composition. Some labels declare that the product is only made of pure jammeed cones, other that the cones are mixed with yoghurt; others that it is based solely on fresh cow's milk, or even lactic casein powder. As ready-to-use products, most of them also incorporate seasoning and spices. This heterogeneity behind the label “jammeed” raises questions about standards and, eventually, quality.

What do we call “jameed”? Despite this heterogeneity behind the label “jameed”, two dairy standards issued by the Jordan Standards and Metrology Organization govern both the solid and liquid jameed production. Who participated in defining these standards? How are these standards implemented? In other words, who has the to right to say what (good) jameed is, or should be, and how does it affect the product? Considering this heterogeneity, were there attempts to register jameed under specific labels or certifications?



Figure 3: Examples of liquid jameed. Cubes of dried jameed are also available (bottom right).

Places of jameed production

Another change concerns the places in which jameed is produced. If jameed is part of the Jordanian identity, not all places are equal when it comes to their renown in jameed production. Jameed from the governorate of Karak, in the south, is portrayed as the best in the country. This is a subject of jokes, such as in the remake of the movie “The Godfather” published on YouTube, where a merchant unsuccessfully tries to sell jameed from Irbid (in the north of the country) to the Godfather, who swears only by jameed from Karak. The video closes with the sentence “Jameed is not jameed if it’s not from Karak.”

However, according to the Jordanian Department of Statistics, about 60 % of the jameed consumed in the country today is imported from neighbouring countries (mainly Syria and Egypt). It is usually sold at lower prices, especially when compared to jameed from Karak (Figure 4). This price difference and the amount of imported jameed raise interesting questions regarding jameed production methods and knowledge transfer.

How did producers from neighbouring countries acquire the knowledge to produce jameed – a product that is not consumed in these countries and is almost exclusively sold to Jordan? How was the process eventually adapted? What were the key features of jameed to be preserved? How do these technical choices affect the price?



Figure 3: Price difference in jameed produced in Egypt (left) and jameed produced in Karak (right). Jordanian dinars (about 5€ (left) to 11€ (right)). Carrefour, Amman Mall, May 2021.

“We do it the traditional way, but with hygienic methods”

Thanks to its method of production, jameed used to be considered a safe product:

*“The natural preservative factors include lactic acid produced by lactic acid bacteria, which **suppresses the growth of pathogenic bacteria and most microorganisms causing spoilage**”* (Abu-Lehia 1988, emphasis by the author)

However, at the end of the 1980s, Jordan was marked by an outbreak of zoonosis, in particular brucellosis, which led Jordanian academic dairy experts to promote the use of pasteurization in dairy production, with the support of government agencies (interview, scientist, January 2019). Jameed did not escape this trend. Furthermore, pasteurizing milk is also considered key to obtaining consistency of quality and is widely promoted in development projects. However, pasteurization implies the subsequent use of specific ferments to start the fermentation process,

but the strains available on the market mostly come from North America or Europe, and are not fully adapted to the dairy products of the Middle East. Development attempts based on imported technology and strains failed:

“[In the 90s] FAO was giving grants to build 5 to 8 factories and had mandated a Tunisian guy as an expert – to replicate the way they do in Tunisia and to train people [...] but [the products] had no flavour and the people, the market, rejected it [...] So we bought machineries and changed the process [...] we use natural cultures from the yoghurt instead of specific cultures that he, the guy, brought with him” (Jameed producer, notes from an interview translated from Arabic to English, May 2021).

Since the early 1990s, Jordanian scientists have been working to identify the microflora of the country's traditional dairy products (Yamani et al. 2007). Their aim was to isolate and develop bacteria that would be specific and adapted to the country's dairy heritage. Jameed is particularly interesting because part of its production process initially involves the use of a sheep- or goat-skin bag to churn the yoghurt:

“Producers rely on the bacteria in the bag. They differ from one country to another, one city to another” (Scientist, notes from an interview, January 2019)

Such attempts to preserve local bacteria in order to keep the flavour, texture and taste of traditional products are not new and are gaining particular momentum in North America and Europe (Slow Food 2011; Percival and Percival 2017). These attempts raise a series of questions about the place of microbiological expertise in agricultural development.

Does development funding come with specific instructions on how to develop these industries technically? What kinds of microbiological expertise do development agencies rely on to promote the scaling up of Jordan's dairy production? What role does local fermentation knowledge play in this process? Do microbes have advocates? What are the microbes that matter in the development of such knowledge, and what are the microbes that are excluded?

Further work is needed to understand better the values, activities and practices of jameed producers, scientists and shepherds, as well as the veterinary and standards administrations and international organizations. The three sets of questions raised in this blog post are those that I would like to investigate in the future, so as to start offering a history of the development of the Jordanian jameed industry.

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