SESSION 3: DAIRY LAND, SUSTAINABLE LAND?

QUESTIONS RESPONSES

with Bernard Faye

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1. For over thirty years now you have traveled the world over for the CIRAD as a specialist in dairy farming in tropical regions. You believe that dairy sustainability is primarily a question of breeding species that are adapted to the various types of spaces?

That is the first dimension of sustainability. That is environmental, ecological sustainability, sustainable dairy breeding being a practice that conforms to the rules for breed and species adaptation to a given environment, makes use of food resources as close to the source as possible and that results in finished products that underscore a territory's specificity and identity.

2. What are the other dimensions of sustainability as regards milk?

I see two others. The second is related to the market (economic sustainability), the question of the price of milk and hence remuneration of the various actors in the sector that are crucial to maintaining production and processing activities. The third has to do with interhuman relations (social sustainability), because milk is an aspect of culture (uses, cooking, traditional nutritional attributes or health claims, imaginary constructs) and helps to maintain rural and/or periurban activity that creates a number of jobs. In many respects, milk production in almost all of the world's ecosystems has helped maintain the rural fabric in environments that may have had very few non-industrial alternatives to do so.

3. Do you feel the sustainability of dairy lands is necessarily related to their very great diversity throughout the world?

The question of sustainability of dairy lands can obviously not be posed everywhere in the same terms. Geo-climatic conditions - prairies, steppes, deserts, plains and mountains - are very different. The socio-economic issues are as well: depending on the case, the aim is to feed one's family or feed cities, maintain a rural livelihood in more or less constrained environments, develop an economic activity, innovate, etc. Not to mention the cultural issues, because the identitarian dimension of the relationship to milk and dairy products varies enormously.

4. You edited a book that has just been published entitled «L'élevage, richesse des pauvres»[1]. The same message is conveyed in the 2009 FAO report on «The State of Food and Agriculture – Livestock in the Balance."[2] In what way is livestock the wealth of the poor?

One detail to start with: in both cases the subject was livestock in general, not only dairy breeding. As regards poverty, it should be kept in mind that out of the 6 billion human beings currently inhabiting the earth, nearly one billion of them do not have enough to eat. And they are mainly smallholders for whom livestock is vital in the literal sense of the term. Not only dairy breeding, but, in this symposium on world milk cultures (and not only in this session), there is no lack of examples of human groups in difficult environments who live only off of milk and a few basic foods that the little surplus milk sold or traded enables them to obtain.[3] Food security for a large segment of the population in developing countries means: having at least something to eat every day. It enables these groups to remain where they live without going to swell the ranks of unemployed in urban megalopolises.

[1] With Guillaume Duteurtre, Editions Quae, 2009.
[2] On line in English at http://www.fao.org/publications/sofa/en/
[3] See in particular Catherine Baroin on the Toubou, Jean Boutrais on the Peuls, Suresh Gokhale on India and Giuseppe Licitra on the role of women and traditional dairy production in developing countries.

5. How does milk differ from other farm produce - in southern countries and in northern countries?

I see milk as having 4 particularities.

1. It is a food-producing product "harvested" daily. That is an asset that insures cash flow and security for farming households, especially in southern countries. Furthermore, it is a product that enters directly into the food ration and throughout the world is largely home-consumed.
2. It is a product that can be processed into hundreds of different products depending on the dairy species, local practices and dietary habits attesting to a remarkable biological and cultural biodiversity, probably more so than most other agricultural productions (subject to inventory). Moreover, such processing can be home-based, farm-based as well as artisanal and industrial.
3. Its production has a number of indirect effects on local development both as regards inputs and outputs (milking, processing, transportation equipment, fresh produce distribution network, etc.),
4. Dairy systems have managed to adapt to nearly the entire world's ecosystems using different species depending on the environment: reindeer in polar regions, yaks at very high altitudes, camels in the desert, cows, sheep and goats that can make use of inhospitable land just about anywhere. This lends milk and dairy systems even greater universality than rice or wheat.

6. All these species give milk that have the same constituents but in different proportions, and with different processing aptitudes, as Frédéric Gaucheron, from INRA shows.

Frédéric Gaucheron describes all these characteristics in detail, attesting to the extraordinary biodiversity of milk. It is a question of means. Thus, water buffalo milk, the second most produced milk in the world, particularly in India and Pakistan, is richer than cow's milk, produces firmer curds, has a higher butter yield but does not have the same aptitude to be processed into as many different dairy products. Ewe's milk and goat's milk have a remarkable cheese-making aptitude whereas mare's milk and camel's milk, which do not naturally coagulate, are difficult to process into cheese and are usually consumed raw or in fermented forms. Yet camel's milk is similar in composition to cow's milk, although with larger casein micelles (over 300 nm) than in cow's milk, the average diameter of which is 200 nm. The casein micelles in ewe's milk are the same size as in cow's milk and water buffalo milk, whereas in goat's and mare's milk they are larger (260 and 255 nm).

7. When you talk about dairy ecosystems, what do you mean other than species adapted to the space?

There's no doubt that the M'Bororo zebu cow, which produces very little – sometimes no more than a liter after having fed its calf – but can walk 40 km a day and go for two days without drinking in stifling heat, and the Holstein, which can produce up to 10,000 liters of milk during a single lactation, are a world apart. If cows have conquered the planet, it is because of their specific characteristics: the taste quality of their milk, the animal's accessibility, its ability to store milk in its udder and allow itself to be milked. But also for the species' remarkable flexibility that allows it to adapt to almost any environment.

8. This great diversity also pertains to breeding practices. For instance, in the United States, the dairy system in Wisconsin described by Sarah Bowen has nothing to do with the system in California and is rather close to practices used on our PDO cheese-producing lands?

Yes, a dairy farm in Wisconsin is usually a herd of 80 to 100 cows on some hundred hectares whereas California mainly has very large herds, of about 1000 cows, in feedlots. This is why Sarah Bowen, a sociologist at North Carolina State University, who has studied the production of Comté in France, considers that it would be a good strategy for Wisconsin to promote its cheeses along the same lines as the European PDO model with a strong link to the land, i.e. both the environment – the pastures and their biodiversity and the landscapes – and the people, i.e. their know-how. Another example of diversity is in Germany with vast differences between former East Germany where dairy farms that came from the former collective farms under the Soviet era have herds of an average of 175 cows, and former West Germany where dairy farms are of family size with an average herd size of 41 cows, comparable to France.[4]

9. When you talk about dairy ecosystems, what do you mean other than species adapted to the space?

Dairy ecosystems include both the place of production and place of consumption, which are inextricably linked. It is fashionable in some policymaking assemblies to claim that milk production would do well to be located primarily in areas with a "competitive edge." In that case, preference would go to areas with extensive grazing lands with rich pastures suitable for more or less intensive breeding that make the success of New Zealand and oceanic Europe agriculture. Or areas near ports where precious soy is imported at competitive prices; such conditions support the dynamism of agriculture in Brittany, to name only one example. Yet on a planetary scale, dairy breeding has also taken over less anthropized areas (mountains, steppes, deserts) as well as more favored areas in tropical deltas and plains in addition to grassy landscapes. In many southern countries, livestock breeding is tending to move closer to the cities (periurban dairy systems), even enter them (urban dairy systems) due to the rising demand for a fresh product that requires cohabitation of producer and consumer.

[4] *See figures in appendix.*

10. So there is city milk in southern countries as there once was in Europe? Like in Ethiopia, which Zelalem Yilma describes?

Periurban and urban livestock systems in Ethiopia described by Zelalem Yilma include intensive intra-urban breeding in Addis-Abeba with high potential cattle and no pasturing, but also smallholdings of two to five cows, raised on grass in small cities or near cities not far from the capital. The example of Ethiopia shows that in southern countries where processing remains largely artisanal, proximity of producer to consumer remains a development asset. Periurban water buffalo dairies have thus been set up in Pakistan, camel dairies in Mauritania, mare dairies in Kazakhstan, even urban dairies at the foot of buildings in the center of large Indian cities. These initiatives are similar by their breeding methods, relation to the market and organization of distribution channels, but they nevertheless remain linked to larger dairy ecosystems. Sustainability of periurban livestock systems remain directly confronted with the pressure of land development as well as the development of dairy basins depending on world milk prices.

11. Can the development of specialized dairies on the urban periphery cohabit with the structuring of production basins?

Yes, this is for instance the case in Vietnam and Ethiopia. Periurban dairies ensure capitals a supply of fresh milk, whereas production basins in the outlying provinces supply cities with processed products (pasteurized milk and fermented products in Vietnam, farm butter in Ethiopia). These periurban systems are based on a "western" technical model: genetically improved cows, even thoroughbreds when climate conditions permit, veterinary inputs and feedlotting, animal housing infrastructure. The practice of artificial insemination, technical supervision by state agencies, sometimes farm packaging of milk round out the range of "modern" dairy breeding methods. Several examples can be observed in southern countries, from turnkey models of modern stables near Dakar down to the smallholders with little urban "backyard" herds in Addis-Abeba or in Indian cities. These specialized systems are entirely market-oriented and involved in the organization of supply channels.

Traditional butter making in Ethiopia. Photo Z. Yilma

12. Whether in northern or southern countries, there is not one single dairy model. You as well as other researchers study the particular case of milk in Uganda. What stands out?

At least six different models of dairy strategy can be identified in Uganda, but these models actually hold true for nearly all the situations observed in the world. The first two models are *subsistence models* in a pastoral environment where most of the milk is home-consumed and where the social function of breeding is preponderant, and *those who sell surplus*. In the *saver model*, breeding activities serve as a springboard for other activities, and milk may be marginal to income, whereas in the *diversified* model a balance is achieved between milk and crop revenues. The *investor model* can be found among farmer-herders who choose to make heavy investments in breeding activities whereas the *specialized* model is that of breeders with a more technical view or involved in agribusiness.

13. Generally speaking, how do dairy systems evolve in northern and in southern countries? And what are the main threats hanging over them in the future?

Dairy systems display great vitality. But they are faced with a variety of constraints depending on local contexts. In northern countries, the large per capita stagnation of consumption restricts the growth of dairy herds which have long since tended toward specialization with a considerable decrease in the number of farms, the relative technical standardization of production methods and high productivity gains. These systems are extremely sensitive to price variations, as we have recently seen. In southern countries, the situation is different because there is a high rise in consumption, even an explosion in countries such as China, India, Vietnam and Brazil, and even in poor African countries due to the effect of several factors (urbanization, changes in dietary habits, economic growth). These systems are in competition on the world market even if competing products from the North are more in a dialectic of competition/complementarity. The remarkable fact in southern countries is the rising trend toward the commercialization of milk and the intensification of its production.

All these systems must also face the recurrent effects of a certain "anti-breeding" lobby that calls into question the role of ruminants in the production of greenhouse gases. Its partial and sometimes caricatural analysis does not necessarily have insignificant impacts on international policymakers.

Milk collection by bicycle in Uganda. Photo B. Faye

14. Among the positive effects of ruminants on the environment that are not sufficiently understood is in particular their role in landscape maintenance. What does Dominique Barjolle, head of the AGRIDEA in Lausanne, have to say about the example of Switzerland?

As Dominique Barjolle explains, the "typical" Swiss landscape is not something to be taken for granted but the product of a slow dynamic in which various actors and politicians interact. Right now, the Swiss pastoral landscapes and the biodiversity they contain are being threatened by the abandonment of farmland and the advance of forestland, especially in the mountainous areas of the Alpine arc and the Jura mountains, areas devoted to dairy farming. Even if communication campaigns for traditional cheese promotes its relation to the land and landscape, this link is scarcely mobilized in communication about more generic products such as drinking milk, yoghurt and industrial cheese. Dominique Barjolle notes that communication surrounding these products places more emphasis on sports, vitality and energy, emotions that hardly conjure up the peaceful aspect of cows in a field. And she regrets that although it may encourage people to drink milk, that does not necessarily mean Swiss milk or milk produced in these landscapes, whereas scientific studies that have demonstrated the effect of pastures on the organoleptic qualities of milk and its nutritional composition could be publicized.

15. Yet Switzerland has enshrined in the federal Constitution maintenance of the rural landscape and decentralized land use as functions of agriculture.

This has indeed been the case since 1996. And the second avenue Switzerland has taken to stem the abandonment of pastoral mountain areas is political, precisely. If payment for dairy products is no longer sufficient to maintain dairy farmers, it must be supplemented by direct payments. This is already the case but Dominique Barjolle tells us that currently there is a political debate on improved promotion and remuneration of agricultural landscape services. The AGRIDEA study shows that opinions on the various types of mountain landscapes differ depending on the respondent's point of view: although all perceive evolution into forestland and landscape closure in a negative light, landscapes in the early stages of overgrowth are valued by a large swath of the population that has little grasp of vegetation dynamics and is unaware of the consequences of the evolution underway. The results of this study thus invite pedagogical improvement as to agricultural and forestry practices that have an impact on the landscape.

Mobile milking station in Savoie. Photo P. Witt /Cniel

16. Could you sum up in a sentence or two all the wealth of the themes broached through the topic of sustainability of dairy lands?

I would answer by recalling a few key notions: the diversity of environments, species and practices, the food-producing nature of animal husbandry for a billion poor people on the planet, and lastly the social and identity dimension of dairy breeding and its link with lands and landscapes that is expressed through its products.