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# Dairy cattle systems in Morocco as affected by structural adjustment policies

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**SUMMARY –** Since the early eighties, structural adjustment policies have been applied to the agricultural sector in Morocco. This has progressively led to the suppression of all kinds of incentives at farm level. As a consequence, cattle systems have been forced to adapt themselves to survive. This paper discusses the diversity of dairy cattle production systems in Morocco. It analyses their functioning parameters (feeding, reproduction, rearing practices) and the productive performances (milk yield per cow, meat production) they achieve. It also evaluates their gross profitability. Then, the perspectives of the economic sustainability of each system are analysed in the frame of the on-going changes affecting the local milk market (free trade agreements). Finally, recommendations are made to assist the prevailing cattle systems in coping with these structural changes.

**Keywords:** Structural adjustment, dairy cattle, typology of farms, profitability, milk yield.

***RESUME –*** *"Systèmes d'élevage bovin laitier au Maroc corcernés par des politiques d'adjustement structurel". Depuis le début des années '80', des politiques d'ajustement structurel ont été appliquées au secteur agricole au Maroc. Ceci a induit un gel progressif de toute subvention à l'échelle des exploitations agricoles. Les systèmes d'élevage bovin laitier ont ainsi été contraints de s'adapter pour survivre. Cet article présente la diversité des systèmes bovins au Maroc. Il décrit leurs performances techniques (rendement laitier et production de viande) et leur rentabilité, à la lueur de l'analyse de leurs paramètres de fonctionnement (alimentation et reproduction). Les perspectives de durabilité économique de chacun de ces systèmes sont ensuite discutées, eu égard aux changements actuels affectant le marché local des produits laitiers (ouverture des frontières). Finalement, des recommandations sont présentées pour assister les systèmes d'élevage bovin laitier à composer avec la nouvelle conjoncture.*

***Mots-clés :*** *Ajustement structurel, bovins laitiers, typologie d'exploitations, rentabilité, rendement laitier.*

## Introduction

Since Independence, in 1956, Morocco has paid careful attention to rural development, because of its weight in general political affairs (Leveau, 1972). Consequently, ambitious agricultural development plans have been adopted (i.e. milk, sugar, cereals plans) to secure food supply for a rapid growing population and to ensure labour for peasants. These plans were heavily supported by state incentives in order to promote local production and to protect it from imported goods. Most of the efforts were concentrated in irrigated schemes where water availability was meant to secure crops (Amri, 1991). Such a policy has led to a successful improvement in domestic production of raw agricultural goods This has maintained the supply of domestic markets with local goods above 60%, for strategic ingredients, such as raw milk, and has also created many labour opportunities.

However, since the early eighties, following the recommendations of the international banking institutions, a drastic structural adjustment program (SAP) was implemented in Morocco, to balance expenses with the country's sources of income. As a consequence, laws were adopted to liberalize progressively trade and to suppress all kind of incentives. This was particularly evident for inputs, which prices often increase, without such an increase in agricultural products prices (Akesbi, 1997).

This paper discusses the consequences of the SAP on cattle farms diversity in Morocco and analyses their perspectives, considering future developments that might affect local farming business, mainly free trade agreements with the USA and the EU.

## Dairy cattle farming in Morocco before SAP

Dairy cattle farming in Morocco is recent. Before colonization, and even with the presence of foreign settlers, very few experiments of intensive milk production were realized. That was due to local food habits, based on cereals and meat, and also because of sufficient milk production by local cattle breeds for a limited population (until 1956, there were only 11 millions inhabitants). However, with the end of colonization and the growth of population at a rapid pace, coupled to urbanization (32 millions in 2004 of which 18 millions of urban citizens), local politicians had to cope with an increasing demand in animal proteins. Consequently, modern poultry production and dairy cattle were intensively encouraged. Hence, in 1975, Moroccan authorities officially launched "the dairy plan" (MARA, 1975). It consisted in a series of measures destined to promote milk production, collection, industrial treatment and consumption. Those measures were strengthened by market protection from imported milk powder. At farm level, the Moroccan state provided a favourable frame for dairy production with incentives on the inputs (feed, milking machinery and imported heifers). It also created an interesting climate for the investors in the sector with an adequate price policy, as raw milk sold by farmers represented almost 75% of the value of milk purchased by the consumers (Table 1). Furthermore, efforts were made by state technical services to promote the constitution of milk collection centres (from 4 in 1970 to more than 900 in 2004), to get raw milk sold, in every location of the countryside. A rapid growth of milk production was noticed, nationwide, even in places which were not suitable for intensive dairying, as many farmers took loans from banks for that goal (El Mesmoudi, 1982).

Table 1. Evolution of milk prices from the producer to the consumer in Morocco

| Year | Production price (1) (Moroccan dirham) | Consumption price (2) | (1)/(2) (%) |
|---|---|---|---|
| 1970 | 0.54 | 1.05 | 51.4 |
| 1975 | 0.90 | 1.20 | 75.4 |
| 1980 | 1.44 | 2.10 | 68.6 |
| 1985 | 2.05 | 3.10 | 66.1 |
| 1990 | 2.62 | 4.10 | 63.9 |
| 1995 | 2.94 | 5.00 | 58.8 |
| 2000 | 2.94 | 5.40 | 54.4 |
| 2005 | 2.94 | 6.00 | 49.0 |

Dairy systems with high merit cows were at that time of limited productivity (< 3 000 kg/cow/year), at the exception of some farms which benefited from intensive technicians' advice. The first diagnosis all showed that State incentives, mainly on feed inputs, created a situation where farmers were not encouraged to produce in satisfactory ways. Even if many farms were making economic profit with such a business, that profitability was totally "artificial" (El Khyari, 1987). Moreover, some farms have developed in totally unfavourable areas, only converting subsidized feed concentrates into milk. This has led to a growing number of farms with acute reproduction problems, mastitis, and deceiving milk yields (Lakhdissi *et al*., 1988), and with bad milk quality.

When SAP measures began to be implemented, one of its first victims was the "Comagri" (Compagnie Marocaine de Gestion des Exploitations Agricoles), which was an important State society, especially devoted to intensive dairying promotion. It managed a dairy herd of more than 3 300 cows in 12 farms throughout the country. Whenever considering its performances, it appears that average annual milk yield was low (less than 3 000 kg/cow), and reproduction suffered severe disorders, as the average interval between calving was more than 410 days (Bradly, 1978).

SAP measures early implementation in the beginning of the eighties was unfortunately characterized by a period of intense drought in Morocco, which resulted in a clear decrease in the number of cattle population (Fig. 1). This drought has also induced a slowdown in the rhythm of milk production and furthermore the imports of dairy heifers were disrupted (Guessous, 1991). At the end of the eighties, SAP measures were all well established with the total suppression on incentives on

dairy production inputs and milk price was liberalized. Thus, it was decided to get an agreement on milk production price between farmers' unions and milk industrials. Practically, this had led to an increase in the margin of milk transformation by the industrial sector, reflected by the growth of the purchase price by consumers whereas the price destined to farmers remained unchanged (Table 1).

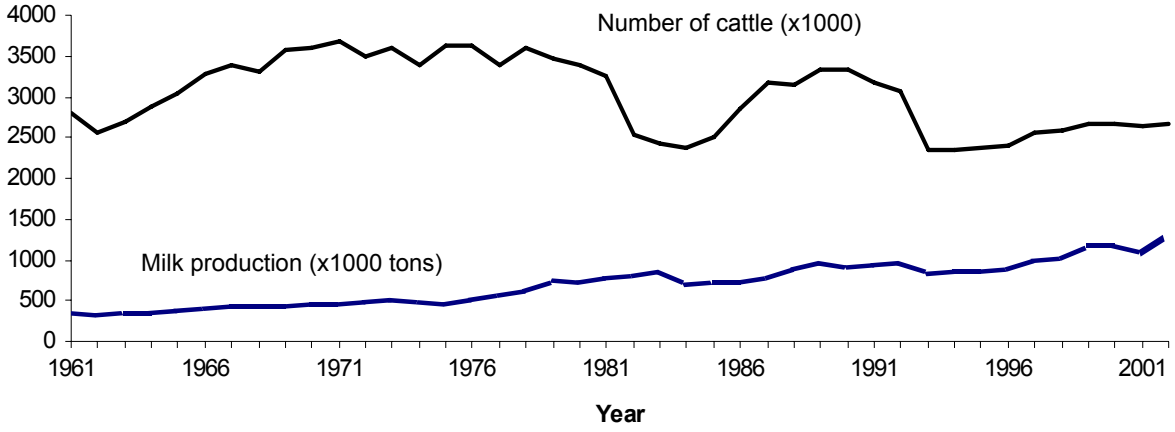


Fig. 1. Evolution of milk production and of the number of cattle in Morocco.

## A typology of dairy cattle farms in Morocco after SAP

After the implementation of SAP measures, some subsequent changes were noticeable in the Moroccan cattle farms. Studies on the typology of farms show a broad variety of strategy production. These could be depicted as follows (Sraïri *et al*., 2003; Sraïri and Lyoubi, 2003):

(i) *a minority of specialized dairy farms* (less than 20% of total cattle farms), with an average annual *milk yield per cow superior to 4 000 kg* and with *significant profitability* (more than 500 Euros/cow/year);

(ii) *mixed meat/milk* production with *low inputs*, which are generally making *substantial profit* (+250 Euros/cow/year);

(iv) *low milk productivity* (2500 kg/cow/year) associated to *important use of purchased concentrates* and with *negative economic results* (-150 Euros/cow/year);

(v) *mainly meat production* with very *low milk yield* (<1500 kg/cow/year) and with *positive economic results* (+ 300 Euros/cow/year).

On the addition of these four cattle rearing trends, a special system was identified. It was represented by state farms owned by the "SODÉA" (SOciété du DÉveloppement Agricole), with a very distinct type of dairying: important amounts of concentrates very efficiently converted to milk (Sraïri and Kessab, 1998). In June 2005, this society, which was managing more than 60 000 ha of irrigated land and with a dairy herd of more than 1200 cows, has been dismantled. These five types of dairy farming were obvious in all the production contexts prevailing in Morocco rainfed and irrigated areas.

Compared to the performances of dairy farms before SAP, it appeared that some improvement was achieved, mainly dealing with milk yield per cow. This could be partly explained by the increase in the genetic merit of imported cows. In addition, the most decisive factor was certainly the adoption of rationale dairying practices. In fact, dairy farmers had to improve their production techniques by the adoption of modern ration formulas. Those skills in feeding were forced to cope with the scarcity of roughage, which is general in Moroccan farming conditions: smallholder farms, aridity and limited forage cultivation and conservation know-how. Consequently, important amounts of concentrates are used in specialized dairying systems (more than 5 tons of concentrates per cow/year in SODÉA farms

for an average milk yield of 6 tons per cow/year). This means that milk production is nowadays closely correlated to concentrates consumption (Fig. 2), particularly in the context of suburban farms or in rainfed areas (Sraïri, 2004), where concentrates play a buffer role to attenuate drought consequences on roughage production (Sraïri and El Khattabi, 2001).

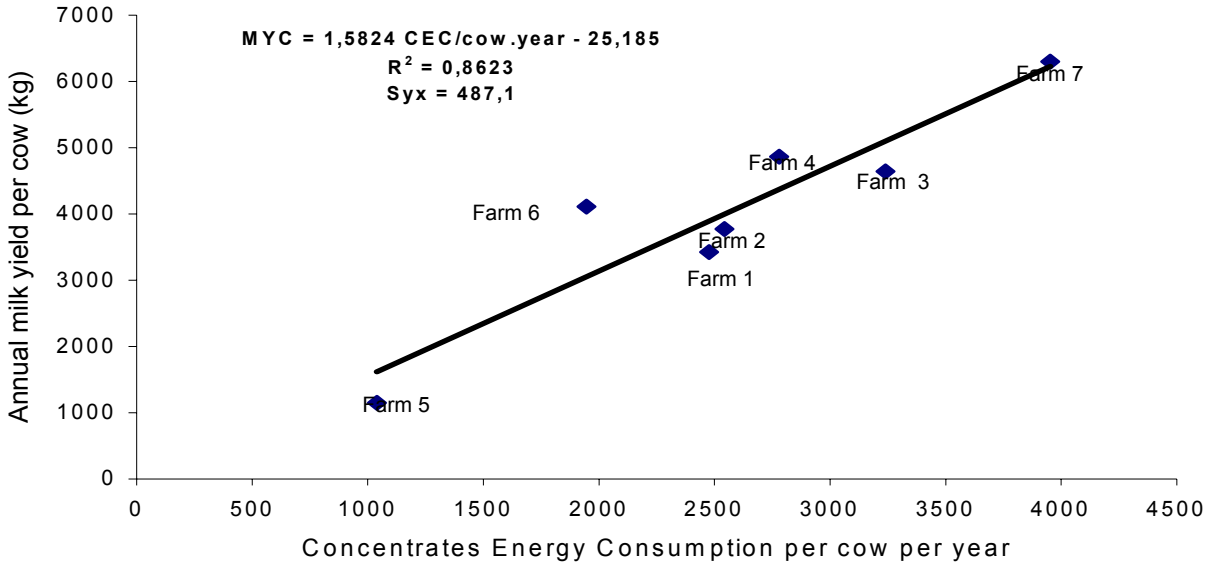


Fig. 2. Relationship between concentrates energy consumption (CEC) and milk yield per cow (MYC) in seven Moroccan suburban dairy farms (Sraïri, 2004).

All together, these results of dairy farms' typology in Morocco, whenever compared to the same results before SAP application, show that these measures had a tremendous impact on the sector. It appears that the suppression of incentives has induced a better feed conversion efficiency, mainly in highly specialized dairy herds. This is obvious whenever considering milk yield or feed formulas used by dairy farmers. Otherwise, in the cattle systems which did not have the technical or financial abilities to adopt modern dairying techniques, production strategies more typically devoted to meat production, even with high merit dairy cows, have been adopted. In fact, it is known in Morocco that beef still comes from herds classified as dairy, in a context of total absence of beef breeds imports, and with local cattle breeds of limited weight gains aptitudes.

## Perspectives of dairying in Morocco under an open market

Dairy specialization, even if it concerns limited numbers of cattle farms, is the most evident result of SAP measures on the sector. On another hand, cattle farms which could not follow those measures and their impact on input prices, had to convert themselves to more extensive systems, paying more attention to meat. Hence, as observed in many other countries which were forced to adopt SAP measures, this policy was not successful to enhance, in all kind of farms, dairy productivity. It was even rather unpopular because of the increase of the prices of inputs (Meertens, 2000). However, and it is particularly true whenever analysing specialized dairy farms' performances, the SAP policy has allowed to establish rationale rules in dairying instead of subsidizing inefficiency. Another consequence of SAP in the Moroccan dairy sector is that it has not decreased the number of farms dealing with that business, but many of them had to change the way it produces milk.

At present time, as most Moroccan industrial milk plants are establishing close links with international dairy groups, and as the consumers are getting more and more aware about quality, there are growing concerns about that feature. This will certainly be a decisive issue for the future, perhaps as important as the increase of volumes, because it is a key figure to generate more income in the whole sector. Unfortunately, because of the inheritances of the past (the "dairy plan" almost

exclusively emphasized on milk quantity), this aspect of milk quality has been very rarely treated at farm level. The rare available references agree that milk hygienic quality is bad (Ounine *et al*., 2004; Sraïri *et al*., 2005). Moreover, these studies both indicate that it is not linked to structural parameters in the farm (i.e. the number of cows or land tenure), but it is determined by hygiene practices. Thus, further extension efforts are still needed, in a context of thousands of smallholder farms which produce limited quantities daily. This will surely constitute an opportunity for dairy farmers, mostly for those aware about quality and its requisites, as it will allow them to negotiate with industrials and look for better price for high quality milk. But this requires to implement a quality payment system which will have to be fair for all kind of farmers, and which takes into account the diversity of milk samples.

## Conclusion

SAP has had an obvious effect on cattle systems in Morocco, as it has induced the end of all direct protection on the prices of the inputs they use. As a consequence Holstein cattle systems have been forced to specialize themselves in dairy production with higher milk yields. This has induced better annual profitability per cow for those farms. Otherwise, cattle farmers who could not or did not want to follow those measures had to look for alternate production strategies such as mixed milk/meat systems or only meat production. Future challenges related to the Moroccan cattle sector are linked to the continuation of the increase of milk yield per cow, also to milk quality improvement, and to global competitiveness in front of imported milk. As free trade agreements with the USA and EU are to be implemented for the whole agricultural sector in proximate years, this will arise serious uncertainties for dairy farmers. It is quite certain that they will have to search for a significant improvement of the quality of raw milk as they will have to continue to decrease the cost of milk production by higher conversion efficiency of feed to milk. These will certainly constitute decisive technical challenges, as they will necessitate higher skills in a specific context of aridity and forage scarcity, far different from western dairy production models.

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