Milk production in Egypt

Mostageer A.

in

Tisserand J.-L. (ed.).
Le lait dans la région méditerranéenne

Paris : CIHEAM
Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 6

1989
pages 31-34

Milk production in Egypt

A. MOSTAGEER
FACULTY OF AGRICULTURE, CAIRO UNIVERSITY
CAIRO (EGYPT)

ABSTRACT - Dairy contributes some 31% to total agricultural production in Egypt and supplies 34% of human consumption proteins. Egyptian production covers about two thirds of total consumption, which is based mainly on cheese. Buffalo milk covers over sixty per cent of the total production, although there are less heads of this animal than of cattle. Buffalo herds produce an average of 915 kg. of milk per head and year, whereas cattle produce only 415 kg. The increase in number of both species is less rapid than the increase in human population. If genetic improvement is essentially due to selection of local breeds in buffaloes, the introduction of improved European breeds by crossings or exploitation of imported herds is common practice in cattle. In any case, the use of highly performing European breeds presents certain problems. It seems that results be obtained according to previous action concerning feeding and prophylaxis.

Key words: Milk production, buffalo, cattle, genetic breeding, human consumption.

RESUME - «La production laitière en Egypte». Les produits laitiers représentent 31% de la production agricole égyptienne et ils fournissent 43% des protéines dans l'alimentation humaine. La production égyptienne couvre environ les deux tiers de la consommation qui se fait surtout sous forme de fromage. Les buffles produisent plus de soixante pour cent du lait, malgré des effectifs de buffles moins importants que ceux des bovins. Les buffles produisent en moyenne 915 kg de lait par tête et par an alors que les bovins ne produisent que 415 kg. Les effectifs de buffles et de bovins progressent moins vite que la population humaine. Si l'amélioration génétique est essentiellement due à la sélection de races locales chez les buffles, l'introduction de races améliorées européenes, par croisement ou par exploitation du troupeau importé, est couramment pratiquée chez les bovins. Toutefois, cette utilisation de souches performantes européennes pose des problèmes. Il semble que les résultats soient fonction d'une action préalable dans le domaine de l'alimentation et de la prophylaxie.

Mots-clés: Production lait, buffle, bovins, amélioration génétique, consommation humaine.

Animal production in Egypt contributes some 31 % of the total agricultural production. The shares to this contribution of the different component parts are as follows:

red meat	37%
milk & milk products	31%
poultry meat	12%
eggs	8%
wool & honey	1%
draft work	7%
dung	4%

Milk production and human nutrition

The average daily energy intake per capita is about 2.700 calories and 77 grams of protein. Animal products contribute about 4% of the daily energy intake and 13.1 gm. of protein. Cereals contribute two thirds of the energy —and two thirds of the protein— intake, and legumes offer 3.7% of the energy and 10% of the proteins. The average daily consumption per capita of animal products (which provide the 13.1 gm. of animal protein) are:

25 gm. red meat*
9 gm. chicken meat
12 gm. fish
5gm. eggs
165 gm. milk

Considering that the protein percentage is 18.6 in red meat, 12 in chicken meat, 8.8 in fish, 12.4 in eggs and 3.5 in milk, it could be seen that milk provides 43.6% of the animal protein consumed per capita daily, the same as provided by both red meat and chicken meat added together.

The total amount of milk produced in Egypt in 1985 is about 1.890.000 tons, distributed as follows:

	production in 1.000 tons	%
buffalo milk	1.195	63.2
cattle milk	665	35.2
sheep milk	23	1.2
goat milk	7	0.4
	1.890	100.0

* Of these 50.1% cattle meat, 31.1% buffalo meat, 16.7% sheep & goat meat, 1.8% pig meat and 0.3% camel meat.

This production satisfies 2/3 of the comsuption, for Egypt imported the equivalent of 900.000 tons of milk, thus providing each individual on the average with 60 kg. of milk per year.

The consumption of milk in its liquid form is not very common in Egypt, though in the last few years the amount thus consumed is increasing, especially in towns. Most of the buffalo and cow milk, and almost all the sheep and goat milk, however, is consumed in the form of cheese and ghee (samna). In a field experiment it was found that of the milk produced by the Fellah, 32 % is used in the household, 12 % is sold as liquid milk and 56 % is sold as milk products.

Milk production

Most of the milk —as shown— is produced by buffaloes, although the actual number of buffaloes is less than that of cattle. This is the 1985 census of cattle and buffalo populations:

Table 1

CATTLE & BUFFALO POPULATIONS (HEADS)

	CATTLE				
	Baladi	Crossbreds	Foreign	Total	Buffalo
Females of the age:					
2 yrs or more	1.772.210	201.796	30.632	2.004.638	1.864.130
less than 2 yrs.	372.791	58.791	8.735	440.317	362.344
Total (females)	2.145.001	260.587	39.367	2.444.955	2.226.474
Males of the age:					
2 yrs or more	554.673	71.677	9.453	635.803	359.262
less than 2 yrs.	405.348	46.682	8.481	460.511	252.125
Total (males)	960.021	118.359	17.934	1.096.314	611.387
Grand total (females + males)	3.105.022	378.946	57.301	3.541.269	2.837.861

(Sheep: 2.4 millions, Goats: 1.6 millions, Camels: 160.000)

The following table 2 summarizes the means of the most important traits of cattle and buffaloes in Egypt:

Table 2

SUMMARY OF SOME ECHONOMIC CHARACTERISTICS OF CATTLE & BUFFALOES IN EGYPT (NUMBER OF ANIMALS BETWEEN BRACKETS)

Trait	Baladi	Friesian	Buffalo
Services/conception	2.25(1640)	2.6(3864)	1.6(427)
Gestation period (days)	286(1797)	276(2214)	315(397)
Service period (days)	116(414)	121(255)	161(347)
Age at 1st calving (month)	39.4(373)	31.9(2002)	39.4(5248)
1st calving interval (days)	489(197)	347(765)	538(166)
2nd calving interval (days)	411(178)	421(570)	419(118)
3 rd or higher C.I. (days)	408(133)	432(973)	426(63)
Body wt. at 1st calving (Kg)	268(214)	326(82)	428(45)
Heart girth at 1st cal. (cm)	161(124)		197(75)
Height at withers at 1st calving (cm)	128(214)		144(45)
Body length at 1st cal. (cm)	121(214)		137(45)
Birth wt. of calf (kg)	25.1(1244)	30.1(652)	36.3(357)
% mortality in calves till 1 year of age	19.6(1120)	19.3(1220)	30.0(5560)
First lactation milk production (kg)	705(479)	1955(2089)	990(147)
Second lactation milk production (kg)	1005(333)	2465(1308)	1230(126)
Third (&higher) lactation milk production (kg)	1290(137)	2985(1062)	1300(113)
% fat in milk	4.45(114)	3.64(76)	6.65(238)
% protein in milk	3.25(100)	3.04(34)	3.87(245)
Longevity (Number of parturitions in lifetime)	3.25(164)	3.11(1864)	3.36(1607)

One point here needs comment. Roughly, a percentage of 45 of the total population of cattle or buffaloes is expected to be lactating animals. This would be equivalent to 70% of buffalo females over 2 years of age, or 80% of such females in case of cattle. Using the forementioned total amount of milk produced by these two species in 1985, the average annual milk production of the buffalo (1.195.000 tons/1.305 million animals) will be of 915 kg. The comparable figure for cattle (665.000 tons/1.604 million cows) is 415 kg. The buffalo mean is not very far from the mean tabulated (arrived at using published scientific papers), while that of the Baladi is much lower. This calls for clarification. Most of the research done on Baladi cattle used the «Damietta» strain, a strain limited in number but known to produce much higher milk yield compared to the «ordinary» Baladis. Over and above, most of the authors deliberately exclude cows of shorter lactation periods, even though most of these have normal short lactations, thus a bias towards higher milk yield appears, masking a very important trait, the short lactation period of the Baladi.

A similar problem arises when estimating age at first calving for breeds or different sire groups. In our country, a large proportion of heifers (which may be as high as 25%) are too late maturing, so that the farmer or the farm manager has to dispense with them (by slaughtering or selling), thus rendering group means biased and comparisons false. A measure, thought to be useful for comparison is the mean age of the first 75 % of heifers calving.

Cattle and buffalo populations increase yearly by a rate of 1.4-1.7 %. The rate of increase in human population is higher, being about 2.2-2.5 %. This means that the animal protein gap would get wider by time, especially that the demand is increasing with the increase of the per capita income (by 5-7% per year).

Almost all of the Baladi cattle are in the hands of the farmers, together with perhaps 99% of the buffalo population. (Government farms produce less than 1 % of the total milk production, private farms of foreign cattle less than 3 %, buffalo private farms about 17%, the rest by Fellaheen). The Baladi cattle are used mainly for draft work and meat production, their milk yield is really very low, and as such the breed fits the needs of the farmer and performs comparatively well under the standards of feeding and husbandry prevalent in the Egyptian village. The buffalo cow produces a reasonable amount of milk with high percentage of fat, but the calves do not perform well in fattening, the percentage of edible meat in carcass is lower than in cattle, and the meat is tougher. With the introduction of mechanization, animals will be exempted from much of the draft work, and the purpose of keeping animals is expected to change towards milk and beef production, or else to be replaced by standard dairy and beef breeds.

Genetic improvement of milk production

Buffaloes call for the establishment of a board to implement a national scheme for genetic improvement, emphasizing perhaps beside milk yield —on the percentage of fat in milk— a trait of wide variation supposed to have a relatively high heritability and on improving meat yield and quality. The selection of a strain of buffalo specialized in meat production may also help in rendering selection for milk production more efficient.

The problems facing the introduction of European dairy cattle in countries like Egypt are the same facing the introduction of highly sophisticated technologies in the third world. You introduce such technologies into a different, but adverse environment to be met with hostility and abuse, with the result of the performance deteriorating. What you are really doing is trying to force people —of different traditions, culture and training— to jump over time with their still limited skills. They need time to swallow, digest and assimilate such new technologies before they are of any real value. Our countries need the introduction of such technologies, but we must —first— let the people watch and hate them, ignore them, get used to seeing them, try to acquire the skills needed before they finally adopt and properly use them. The farmers in Europe did not have the high milk producers carried to them over time on board of aeroplanes or ships. The milk yield of their cattle increased by time, with the farmer asking for developing new technologies to meet his increasing needs. The European farmer all the time was expecting the new technologies before them being realized. Any new technology carries history with it, and it is no use introducing technology without history. We want our farmer to acquire the skills of the European just by facing him with the new technology. He needs time, and time we must allow him. Time in the field of dairy cattle means grading up the indigenous cattle with the standard dairy breeds, and that implies grading up his skills along with grading up his cattle. One may depend upon the fact that the Fellah has got a sharp economic sense. He can detect profit; get him convinced — economically - and he'll strife to develop his skills to adopt whatever technology you offer, be it a milk machine (a cow) or a milking machine.

Crossing with European cattle breeds

Crossing Baladi with European cattle breeds increases the milk production tremendously. In a crossing experiment in which Baladi females were sired with five breeds (namely, Red Angler, Braunvieh, Deutsches Braunvieh, Grauvieh and Friesian) the crossbred animals (105 cows) averaged 1.860 kg milk in the first lactation and 2.225 kg. in the second, compared to a Baladi control group (12 cows) averaging 420 kg. and 660 kg. in the two lactations, respectively.

In another experiment, the Damietta strain of Baladi was graded up with Friesian and the milk yields of the first two lactations were as follows (number of animals between brackets):

	1st lact. milk yield (kg)	2nd lact. milk yield (kg)
Baladi	1175 (97)	1355 (94)
1/2 Fr	1700 (104)	2305 (94)
3/4 Fr	1790 (230)	2155 (193)
7/8 Fr	1900 (198)	2400 (165)
15/16 Fr	1855 (87)	2300 (66)
31/32 Fr	1805 (93)	2400 (63)
pure Friesian	2000 (190)	2955 (109)

One point here draws attention. The animals of grade 31/32 Friesian had average milk yield lower than that of the pure Fr. in both lactations (by 200 kg. in the first and 550 kg. in the second) though supposed to have 97 % of the Friesian genetic material. Such observation could be seen in most of the grading experiments of indigenous breeds in the third world. Since this percentage of Friesian blood is supposed to be present «on the average» (also in all grades higher than F_1), the logical conclusion is that the Baladi genetic material may have some advantage under our environment to be present in percentages higher than expected. The ratio R of indigenous blood in backcrosses could be estimated from production data as:

$$R = \frac{1}{2} \text{ (FR -BC) / (FR - F1),}$$

FR, BC and F1 being the mean production of the foreign breed, the backcross and the F_1, resp. Applying this equation to the first lactation milk yield of grade 31/32 would show that this backcross could be taken as a hybrid of 32 % Baladi

+ 68 % Fr. The hybrid of the second lactation would be 43 % Baladi + 57 % Fr. A kind of selection favouring the Baladi genes seems to work, especially that their percentage in the second lactation is higher than that of the first.

The introduction of European breeds

The introduction of European dairy cattle breeds would be the quickest way to change the cattle genotypes in Egypt. Such animals in my opinion would not fit the ordinary Fellah for the time being. They may be useful in large private farms or governmental farms, and thus could be used in providing sires (semen) for grading up the Fellah's animals. However, available reports and research on the performance of these cattle under the adverse conditions in their new habitat, feed, health care and management show clearly that their productivity and reproductivity deteriorate, that is compared to the European standards of performance. The stressful environment may arrest the full expression of the exotic genotypes, also, animals of relatively high milk yield may be rejected earlier and consequently have shorter longevity compared to those of lower production. Comparisons in each lactation between means of milk yield of cows staying in farm to calve and start the next record (group A) and those with no subsequent lactations or parturitions (group B) would show if a kind of negative selection is at work. The following are some of the results we obtained using such analysis in the first lactation (number of animals between brackets):

	milk yield in kg. of		difference in kg. (B - A)
	Group A	Group B	
Friesian	3365 (1292)	3655 (219)	+ 290
Jersey	3330 (52)	3730 (94)	+ 400 NS
Baladi cross-breds	1640 (83)	2050 (22)	+ 410
Pinzgauer	1990 (109)	1615 (67)	— 375
Buffalo	1160 (56)	1030 (51)	— 130 NS

* (It is to be noted that there was active deliberate selection for milk yield in the Pinzgauer herd).

The importation of large numbers of European cattle in the Arab world was and still is a controversial issue. The results presented suggest that without improving the standards of feeding, management and veterinary services prior to the introduction of such breeds, the local environment will refuse the high producers. The standard of the dairy breed to be introduced should fit the standard of the indigenous environment. Data on foreign dairy cattle already existent in most of the Arab States could help as guide in each country or region. A breed of high fecundity which produces 3.000 kg. of milk/lactation, to be bred in big private and governmental farms and used for grading up the Fellah's Baladi cattle, would, in my opinion, fit Egypt for the time being.