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Saving threatened native breeds by autonomous production, involvement of farmers organization, research and policy makers: The case of the Sicilo-Sarde breed in Tunisia, North Africa ☆

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Abstract

The Sicilo-Sarde, the only native milking sheep in Tunisia and in North Africa has undergone a considerably population reduction from 200,000 ewes in 1995 to 25,000 ewes in the year 2000. Low sheep milk price and a shift to dairy cattle were among the reasons for this decline. The main objective of this study was to report on the impact of farmers organization, technology transfer and market on reversing the dramatic decline of this native dairy sheep breed to a promising livestock development model. Having at the grassroots a "pioneer" who chose to form the Sicilo-Sarde breed association in 2003 was a key ingredient in the process of saving this breed from disappearance. Quick steps were first taken: Selling milk through the association allowed doubling its price in one year. A new legislation benefiting dairy sheep was introduced. A trilogy principle was followed where breed owners, researchers and policy makers interacted together to find optimum solutions that fit expressed needs of breed owners. An applied multidisciplinary research program was established and tackled major constraints faced by the breed in nutrition, management, reproduction, health, breeding and product development. Encouraged by an unsatisfied market and good prices, small farmers with a few cows started shifting to dairy sheep and poor new ones managed to get loans to purchase dairy sheep breeding animals. Based on a total of 7937 lactations recorded during the period 1997–2002, average milk yield, days in milk and suckling period were 89 kg±47 kg, 139 d±47 d and 104 d±22 d, respectively. Given the low producing ability of the breed and the impossibility of importing proven rams for health considerations, frozen semen from 17 Sarda rams was imported from Italy and 1600 ewes from 12 flocks were inseminated by intrauterine in 2005–2006. Fertility, prolificacy, and mortality rates varied from 47% to 63%, 157% to 184% and 0 to 34%, respectively. The decline of the breed was stopped and reversed and members of the association and small farmers in the region will benefit from the produced offspring. While currently the association is accessed by more organized producers, it provides an opportunity for the integration of smaller, poorer producers to improve their livelihoods. This case has inspired another group of farmers of a native sheep meat breed to form their own association to promote their breed.

Keywords: Sheep; Dairy; Sicilo-Sarde; Insemination; Fertility; Association

1. Introduction

During the second half of the 20th century, the world has deeply changed: Scientific knowledge have made major steps in biology. Agriculture has shown its

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productive capacity, particularly in developed countries—Europe and North America. At the turn of the new century, the situation has changed: agricultural products have become international challenges in world trade policies, negotiations and regulations between developed, developing and countries in difficulties. Non renewable fossil energy, on which agricultural development models were shaped, is now questionable. The use of pesticides and chemicals under intensive production systems have led negative consequences at environmental and health levels. At the same time organic agriculture was unable to meet quantitatively increasingly human feed demands.

The global climatic changes, which consequences are still not fully measured, are raising a feeling of impasse. All these forces are putting agriculture in general and livestock in particular in front of new challenges, high risks and uncertainties world wide. Under these conditions, the maintenance of agricultural resources becomes a global imperative. Fragile ecosystems should be properly protected and wisely exploited especially many native breeds are encountered under such conditions and they guarantee a livelihood where high input high output livestock systems are not feasible (Iniguez, 2005). This is a true challenge for the future given the present socio-economic value of native breeds, which creates income for large human populations in developing countries and for small farmers in rural areas and the renewal interest for the development of regional products.

Under harsh environment conditions, specific approaches should be sought to allow sustainability in the prevailing production systems and to be sustainable, the latter must prove their ability to maintain a level of productivity, without the threat of long term damage or degradation to the environment or resources base. ”Autonomous production (AP)” defined as the quantity of animal products (meat or milk or both) by a given flock/herd–year within their low input production systems and with available feed resources can be a potential measurement of native breeds’ AP. The degree of involvement of key operators (farmers, civil society organizations, research, and policy makers) is pertinent and essential to the success of any efforts toward increasing “autonomous native breeds production” and improvement of farmers livelihood.

In Tunisia, it has been identified that the Sicilo-Sarde breed, the only native milking sheep in the country and in North Africa has undergone a considerably population reduction due to indiscriminate crossing and a shift to dairy cattle benefiting from national incentives. The objective of this study was to report on the impact of farmers organization, technology transfer and legislation on reversing a dramatic decline of this native dairy sheep breed to a promising livestock development model.

1.1. History of the breed

The Sicilo-Sarde breed was the result of a long term crossing process between the Sarda and the Comisana realized, in late 1800 s, by Italians in Northern Tunisia. In the fifties, the breed after been fixed, supplied a well known processing cheese unit in the region with 7000 l/d which represented, at that time, only 40% of the total milk produced by the breed. After the independence in mid fifties, most of the Sicilo-Sarde flocks remained in state cooperative farms.

Based on a total of 7937 lactations recorded during the period 1997–2002 average production traits were 89 l±47 l in milk yield, 139 d±47 d in days in milk, and the average suckling period was 104 d±22 d (Table 1). These results showed the long suckling period practice followed by flock owners. This is a translation of a dual purpose breed management applied to an originally specialized dairy breed. Milk prices of dairy sheep are shown in Table (2). The majority of the total milk sold is bought by a cheese processing unit in the region which has been for a long time the only processing unit specialized in dairy sheep in the country. Little amount of milk is transformed at the farm level (Selmi Imen, 2004; Saâdoun et al., 2005).

1.2. Decline of a breed and signs of failure

With the privatization process of state farms, the Sicilo-Sarde breed saw its population size decreased from 200,000 ewes in1995 to only 25,000 ewes by the year 2000. Low sheep milk price and more incentives for dairy cattle were among the main reasons for this decline. When state farms were privatized, the new investors chose to shift to dairy cattle instead.

From 1995 till the year 2000 a variety of alternatives were tried by national and international institutions to stop the decline of the breed and save it from extinction, but no success was realized. By looking back, these days, to the failure of all undertaken alternatives, the lesson learned from this period shows that most of the

Table 1
Production traits of the Sicilo-Sarde breed

Trait	Lactations	Average	Standard deviation
Milk yield (liters)	7937	89	47
Days in milk	7937	139	47
Suckling period (days)	7937	104	22