

*George Attard, Director, Institute of Agriculture,
University of Malta*

ALTERNATIVE PRODUCTS BY THE LIVESTOCK SECTOR IN MALTA

Introduction

Malta became a member state within the European Union in May 2004. The Maltese agricultural sector now has access to one of the largest markets, but in return had to remove all sorts of protectionism from inbound European products. As we stand to-date, two years post membership, the livestock sector is expressing a lethargic attitude and portraying an air of despair and confusion. In evaluating the real extent of deterioration, one should separate the facts from perceptions of the present situation as compared to the real situation prior to accession.

Fortunately, several reliable comprehensive references are available. They include a comprehensive study entitled *Malta Agricultural Policy and EC Membership: Challenges and Opportunities* by FAO; *Animal Waste in Maltese Agriculture* by Peter Jackson; and *Census of Agriculture 2001* published by the National Statistics Office, Malta. FAO's project had the objective of carrying out an agricultural sector review aimed at the implementation of the new international and domestic policy changes necessary for eventual EU membership. The findings, with particular emphasis on

the proposal for dealing with key agricultural policy, were presented in the report.

The aim of this paper is to compare and contrast aspects of livestock production pre and post membership. Alternatives to meet the challenges and opportunities will also be suggested.

Main constraints

The boundary within which the livestock industry has to operate defines the parameters that limit animal production in Malta. These main constraints can be summed up as the 1) availability of land base, 2) availability of water suitable for livestock and crop production, 3) quantity and quality of feed and 4) production and disposal of manure.

As could very well be understood, since surface area is limited, pressure on land from the non-agricultural sector has caused the agricultural production base to decrease. Presently, about 11,620 hectares of different land classes are available for agriculture. Over the last few decades, part-time farmers were encouraged to contribute to agriculture resulting in a situation whereby presently less than 10% of farmers are full-timers permanently engaged in agriculture. This influx of part-timers, all wanting to cultivate their vegetable patch, has had a significant overall negative effect of the sector. The average farm size is 0.876 hectares and 45% of farms are between 0.1 and 0.5 hectare. Furthermore, the situation is further confounded with the nesting problems of ownership, fragmentation and the tenancy act. Following the transfer of Church-owned property to the State, Government became the largest landowner, possessing some 60% of the national territory. Farmers and individual landlords own the

remaining 40%. However, the farmer that tills it owns only a relatively small percentage, 19.5% of holdings. This structure of ownership has hardly changed over the years since the State is reluctant to sell. In addition, landlords tend to hold on to their property as a means of investment in the hope that someday their property might qualify for urban development. Farmers tend to divide their land equally amongst all their children in a way that each child gets an equal share of the land. Tenancy rights are inherited in similar manner to ownership and without obligation of informing the landlord. Land fragmentation very often leads to problems in relation to access roads, water share, agricultural investment and tenancy rights. Under this system of land tenure, farmers make productivity enhancing investment only in farmer owned land.

Summing up all the forces in play, one can easily conclude that the average farm of 0.876 hectares may 1) in whole or in part be property of third parties, 2) not be in one parcel of land, and 3) since the tenant is protected by the tenancy act, the tenant may be using farming as an excuse to retain access to the land for activities other than farming, very often related to hunting. This unique situation is of particular significance to the livestock sector. The super micro-scale of the production surface base is the main culprit for: 1) the evolution of highly dense, highly intensive production systems; 2) the huge challenge of manure storage and disposal, and 3) roughage production.

The small land-based animal production units are the main driver responsible for the evolution of the highly intensive livestock system. Very often complications of inadequate farm design, animal flow, lack of automation and high stocking densities are characteristics of the

average animal farm. Furthermore, manure storage, handling and disposal are challenges faced by the majority of production units. All these factors combined pose a serious threat to the general production efficiency, including animal health and welfare.

Since Malta lacks any form of permanent surface fresh water bodies, the majority of crops are fed by rain. The semi-arid nature of the islands is characterised by wet winters and hot, dry summers, with a predominance of rainfall during the month of October. Unfortunately, this pattern of precipitation provides moisture during a period when demand by crops is relatively low, i.e. when rate of plant growth is at its slowest. Conversely, when the potential for plant growth is high, natural moisture is almost completely absent. Furthermore, the high variability in rainfall patterns could have a drastic effect on crop quantity. On the other hand, fodder quality is significantly correlated to time of harvest. Taking sulla (*Hedysarium coronarium*) as an example, it reaches maximum nutritive values at 10% bloom, and hence should be harvested at this stage of maturity. In reality, this fodder crop is harvested at a much later stage, when the plant would have reached maximum bulk at the expense of nutritive value. The bulk would be highly lignified and the only nutritive parts i.e. the flower and leaves are so brittle that they snap off and are lost during harvesting. Only the highly lignified portion would eventually be harvested. Quality roughage is a fundamental prerequisite for efficient ruminant production.

These issues mentioned above summarise concisely one of the most fundamental problems confronting the livestock sector. These obstacles need to be tackled urgently by the competent authorities to establish solid foundations conducive to the proper development of a

sustainable livestock enterprise. Following such a reform, the livestock sector would not only survive, but also be in a position to capitalise on the fact that we are an island EU member state in the middle of the Mediterranean.

Livestock Sector Pre-Accession

The livestock industry in Malta pre-accession accounted for 65% of gross agricultural output. The main livestock enterprises were 1) dairy including cows, sheep and goats, 2) beef cattle, 3) swine, 4) poultry, and 5) rabbits. It is reported that at the time, Malta produced adequate pork, poultry and rabbit meat, and sufficient eggs to meet its requirements. This statement is not completely correct and should be viewed in the following manner. Commercially available balanced feeds are in their major part corn and soybean based. All cereals intended for human or livestock consumption are imported and the livestock industry depended completely on imported feeds. Imports amounted to the total feed requirement in the case of swine and poultry needs and 75-80% of requirements in the case of ruminants. Feed in the form of balanced compounded rations is available commercially from feed mills. Therefore the above statement should not be interpreted that Malta had at anytime achieved any level of food security, but rather it should be interpreted as having the capacity to transform imported cereals into animal products to meet national demand for meat and eggs.

The bulk of the milk produced by the dairy sector was processed as fresh liquid milk. Some 20% was transformed into rikotta cheese, yogurt, cream and other products. All the requirements of milk powder, condensed milk and

butter, and also the bulk of its cheese requirement were imported. The dairy industry also accounted for 30% of the beef consumed, supplying bulls at 15-18 months and beef from cull dairy cows. Sheep and goats gave a small contribution to the dairy sector too. Most were kept to produce milk for home consumption and for the production of cheeselets. Only a few flocks were licensed to sell milk. Licensed producers operated under a quota to supply milk. Since all milk is sold at the same price, the milk is not marketed separately. Some meat is produced from lambs and kids not required for replacements and from culled animals.

Locally produced pork accounted for one third of total meat consumption. The 160 pig farms operated under a quota system. The quota system did not create pressure on the swine industry to be more efficient in terms of sow performance or in growth efficiency since 16 market pigs per sow per year had a guaranteed market place and price. This industry had no competition and imports of pork for direct consumption were not possible. The total breeding herd amounted to about 7,600 sows and F1 breeding stock was obtained from local multipliers. Farmers may not have been aware of the potential production since no research on pig production was available. The main concern was to have sufficient pigs ready for market to meet the monthly quota allocation.

The poultry industry in Malta had started a development programme in the 60's to transform the traditional backyard system to the most modern system possible at the time. The facilities present on most farms poultry, namely buildings and equipment, were still those acquired during the 60's. Many buildings needed to be either redesigned or rebuilt. Similarly, many of the layer cage units needed replacement. No egg-grading system

was available and most eggs were sold loose. Facilities for chilling and grading eggs were very limited. Following developments of the egg sector in the 60's, a similar development programme was initiated on broilers. Malta had a total capacity of 5.5 million broilers per year. All day old chicks were hatched locally and some 80% of hatching eggs were imported.

Rabbit meat accounted for an estimated 8% of total meat consumption. Rabbit production was predominantly a backyard industry where in a significant number of cases, rabbits were produced to meet the needs of the immediate family. Breeds used in this system were of mixed genetic background with a significant incidence of inbreeding. Hybrids based on New Zealand White and California breeds are used on the few commercial run units.

The intensive production system coupled with the lack of on farm physical space makes it difficult to handle manure with all the animal dung and urine being concentrated in the buildings and yards. Manure from cattle, sheep and goats accounts for 60% of total manure production and pigs and poultry for 25% and 15 % respectively

Post-Accession Alternative Options

In analysing the impact of EU membership on the agricultural field, the FAO report states that the primary concern in the immediate future has to focus on how to achieve sustainable agriculture and rural development. Although the economic role of the sector has been quoted as being of minimal importance, agriculture still plays a major role in the offsetting of the negative effects of over urbanisation; in contributing to the protection and improvement of the quality of rural areas as both a habitat

and landscape. The foremost concern is to consolidate the performance of the livestock sector, with particular emphasis on retaining the land base for productive and ecological purposes. To achieve this consolidation the FAO report recommended the following measures: 1) review land tenure system and improve the management of land resources, 2) improvement in the management of water resources, 3) introduction of high yielding, cost effective and environmentally acceptable production techniques, and 4) improvement in the marketing of agri-products.

The key constraint to the livestock sector in Malta as discussed in the beginning of this paper is the unresolved land tenure and fragmentation issues. Land fragmentation very frequently leads to problems in relation to access roads, irrigation water, agriculture investments and tenancy rights. In view of the urgent need to improve the present system, the competent authority should propose a programme that would facilitate the acquisition of land through the purchase and ownership by those willing to invest as full time farmers. This reform will affect in particular the level of technology applied to the production of annual and perennial crops, thereby indirectly affecting milk and meat production. The programme should promote the consolidation of small holdings and the access to the now larger more efficient parcels. This could result in a reduction in full time farmers and would permit those remaining to benefit through a reorganisation of holdings into economically-sized production units. This would also promote higher labour productivity and the employment and increased agricultural output. Following the reform, those that remain within the sector would have their main source of income from agriculture. Thus, the degree of commitment

would be much higher than that of a part-time farmer whose revenues depend on other sources.

It is generally acknowledged that the lack of sufficient quantities of good quality water is one of the most important factor that limits development in the agricultural sector. As already explained access to adequate land and water resources are fundamental for the utilisation of manure and the production of quality roughage. Presently, wheat constitutes the main cereal grown followed by barley and oats and small quantities of maize and millet. In the case of fodder legumes, sulla is the main crop grown. Part-time farmers grow most cereals and folder crops on non-irrigated land. In some cases part-time farmers employ labour for seeding and sell the crop either standing or in bales. Originally crop varieties were selected for early maturity, as the dry climate could induce shattering instead of ripening. Varieties are now being selected for long straw characteristics, since cultivation is solely for animal fodder production. The fact that cereal cultivation is predominantly done by part-time farmer reflects that in most cases these farmers are using the land for other non-agricultural related activities. Cereal cultivation is just an excuse to be covered by law and impede eviction.

Hydroponics grass production may be a suitable candidate. Commercially available "grass machines" are available on the market in a range of sizes and capacities. These units are essentially a small greenhouse structure, equipped with hydroponics and climate control equipment, where trays of seeds sprout and grow into green fodder in an 8-day cycle. Widely used in Australia as an insurance against drought, this technology could be applied here to overcome limitations in land and water resources. The system is capable of producing trays of green grass, around 20cm high, after only 8 days from

seeding. One kilogram of seed yields 6 - 10 kgs of green fodder. Since the system uses no medium of any sort, it means that the cattle get to eat not only the emergent leaves, but also the entire root system, the latter adding to the fibre and protein content of the feed. Feed analysis show that the nutritive value of the fodder compares favourably in terms of its crude protein and Metabolisable Energy (ME). As fibre levels are generally low, in practice it is generally regarded as a supplement to the diet. Any cereal grain can be used in the system, but barley and oats give the best results in terms of yield weight.

According to the last Census of Agriculture, the 8,332 milking cows are dispersed over 281 herds, bringing the average herd size to 30. Dr. Peter Jackson states that the average yearly milk yield per cow stands at 4,800 kg. These two facts alone give a clear indication that the dairy sector has ample room for technological development. If cows are grouped in herds approaching 100 milking cows, producers would accumulate sufficient numbers to justify full-time employment. Furthermore, with proper management, production could easily approach their genetic potential in milk yield, i.e. at least 10,000 kg per cow per lactation. If both recommendations were to be implemented, the same quantities of milk could be obtained from 45 units each housing a herd of 100 milking cows. Such a recommendation would allow the remaining farms to capitalise on the economy of scale whilst liberating the rest to diversify. Many options are available for consideration in evaluating diversification. Some of the empty units could be converted into the custom heifer production units. With the accessibility to modern technology, the national herd could be synchronised and impregnated with high genetic merit sexed embryos. Once born, they would be managed on specialised units

that will enhance the proper development of these heifers and supplied to the local and regional market demands.

Indigenous sheep and goats are renowned for their hardiness and prolific capabilities even under our Mediterranean environment. Unfortunately, the few remaining animals are poor examples of the pure breeds that once roamed so freely. A huge effort should be undertaken to rediscover, maintain and improve the genetic base of these populations. Concurrently, milk should be processed and marketed separately so as to achieve product identification and also provide the raw material for the development of other value added goods such as dairy and cosmetic products. Efforts to regain these populations are well justified also bearing in mind that these breeds enjoy an excellent reputation all over the basin and a market for stock already exists.

Other non-traditional options should also be given due consideration. The following is an example from Northern Italy. Buffalo farming is typical to Central-Southern Italy. Buffalo milk is not controlled by quota systems, has a higher fat content than cow's milk, commands a higher price and is processed into fresh Mozzarella. This typical product is well known and highly appreciated both in locally and on international markets. The Italian buffalo was incorporated into a genetic selection and improvement program resulting in an animal with an average live weight of about 600 kg and a genetic potential to produce an average milk yield of 2,168 kg per lactation. Buffalo is a recent introduction into the Po Valley of Northern Italy. For economic reasons, the small dairy farms sold off their quota to larger more efficient dairy producers in Central Italy. The buffalo is an ideal candidate since farmers could purchase stock and utilize the same on farm facilities that were previously used for cows. In this case buffaloes

represent a promising possible alternative to dairy farming. In our scenario, the buffalo offers in addition its hardy rustic nature to withstand our environment and has the ability to digest poor quality roughage and to recycle endogenous nitrogen more efficiently than cows.

Beef production may also have interesting potential. The fact that beef numbers are small, the ideal situation is to create a market niche around locally produced beef. Prior to the availability of commercially available feeds, imported yearlings were fattened on a diet composed of cereals, carob, cotton seed expeller. These traditional diets need to be revived, tested and improved so that local beef could be branded so. Thus an industry based on the concept of a Maltese steakhouse offering locally produced beef could emerge.

The swine industry likewise needs restructuring. The national sow herd should be reorganised into units each housing not less than 100 sows to achieve efficient resource utilisation. Opportunities may exist in organising the sector to produce quality F1 stock to export into neighbouring countries. This concept is not a new venture for Malta. Bowen-Jones reports that in the 1960's Malta exported Large White breeding stock into Yugoslavia. The 7,600 sow population offers sufficient diversity that if properly managed could serve as the base for a professionally run genetic improvement program. Potential of exporting growing finishing pigs as well as breed stock should be seriously considered.

The poultry sector is also in need of restructuring, not only with respect to production units but also with regards to providing facilities for egg grading and an organised structure to oversee egg production and for the marketing of live broilers. Nonetheless, alternatives are also available for this sector. Producers should specialise

according to activity (layer or pullet), and type of bird (white vs. brown hens) kept. The layer industry should consider branding its products to capture market niches. Egg shell colour, yolk colour, nutritive value and free range classification all have potential. On the other hand, the broiler industry also has room for improvement. The simplest improvement involves the rearing of broilers according to sex. This would allow the producer to have better feed management and a more homogeneous broiler crop. This simple modification would result in immediate profits to farmers. Other improvements leading to greater profits could be found in rearing techniques, speciality products and proper marketing.

Conclusion

The main characteristics of Malta's relatively small agriculture sector and its obvious limitations to growth, may be perceived as a sector that has a minimal contribution on a national scale. The smallness in Malta's potential production of any commodity can never aspire to be a price giver on an international market, but rather will have to be happy as a price taker. This paper has identified constraints affecting the livestock sector that are not connected to EU membership. Once these difficulties are overcome, the livestock sector should grab the opportunity to face the challenges and take advantage of all the opportunities. Our smallness and the physical isolation from main land Europe provides us with unique market niches for our livestock sector since high health standards could easily be achieved and maintained.