

## SUSTAINABILITY OF TURKISH GREY CATTLE IN ORGANIC SYSTEM

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**Abstract:** Beef consumption has significantly increased in the last fifty years as a response to the increase in population size, whereas the sustainability of production systems has begun to be questioned. Because the residues left in the animal feed additives used in conventional food production constitute major health problems in consumers. Therefore, an interest in organic farming methods based on natural grazing and feed production without the use of chemicals is increasing. One of the most important examples of organic beef production in Turkey is the project carried out in the villages of Ayvacık district in Çanakkale. This region has an ecological structure which does not allow an extensive production of culture cattle. The most important advantages of the Turkish grey cattle living in the pastures in the region covered with bushes are that they have less needs of shelter, they do not need supplementary feeding throughout the year and labor costs for their production for beef are low. Breeders in this region maintained a market price for their products by shifting to organic system and thus allowed the sustainable production of the Turkish grey cattle. In this study, Ayvacık Organic Beef Production Project which sets an example for the sustainability of Turkish grey cattle production by featuring its surplus values was evaluated.

**Key words:** Organic animal husbandry, Turkish grey cattle, beef production.

### Organik Sistemde Boz Irk Sığırların Sürdürülebilirliği

**Özet:** Son elli yılda nüfus artışına paralel olarak kırmızı et tüketimi önemli ölçüde artmış; buna karşılık üretim sisteminin sürdürülebilirliği sorgulanmaya başlanmıştır. Çünkü konvansiyonel üretimde kullanılan yem katkılarının hayvansal gıdalarda bıraktığı kalıntılar, tüketicilerde önemli sağlık sorunları oluşturmaktadır. Bu nedenle doğal otlatma alanlarına ve kimyasal kullanılmaksızın üretilen yemlere dayalı organik hayvan yetiştiriciliğine ilgi artmaktadır. Türkiye’de organik kırmızı et üretiminin en önemli örneklerinden birisi Çanakkale’nin Ayvacık ilçesine bağlı köylerde sürdürülen projedir. Bu yöre kültür ırkı sığırların ekstansif yetiştirilmesine imkan vermeyen bir ekolojik yapıya sahiptir. Yöredeki çalı kaplı meralarda yaşayan Boz ırk sığırların en önemli üstünlükleri barınak ihtiyaçlarının az olması, yıl boyunca ek yemlemeye ihtiyaç duyulmaması, et üretimi amacıyla yetiştirilmelerinden dolayı işçilik maliyetlerinin düşük olmasıdır. Yöredeki yetiştiriciler organik sisteme geçerek ürünlerinin piyasada değerini bulmasını ve böylelikle Boz ırkın sürdürülebilir üretimini sağlamışlardır. Bu çalışmada Boz ırk sığırların artı değerlerinin ön plana çıkarılarak sürdürülebilirliğinin artırılmasına örnek oluşturan Ayvacık Organik Kırmızı Et Üretim Projesi ele alınmıştır.

**Anahtar kelimeler:** Organik hayvancılık, Boz ırk sığır, kırmızı et üretimi.

### Introduction

Industrial animal husbandry has brought many adversities, such as increased susceptibility to diseases in animals due to being tied or strolling in narrow spaces with very little movement; overturn of the natural balance, water, soil and air due to the emerged feces and gas; the adverse effect of getting away from the pastures on the components of animal products such as fatty acids and insulin-like growth hormones to the socio-economic structure and animal and human health (Kaymakçı 2012). On the other hand, since the residues of feed additives used in conventional production of animal foods cause important health problems, the consumer demands for foods produced without chemicals are increasing (Wahlshe et al. 2006).

"Organic animal production" depending on pastures and feeds produced without using chemicals is an environmentally less harmful and more ethical production system. Organic animal products are considered as of high quality, residue-free and lower fat containing products by consumers (Kouba 2003, Van Ryssen 2003). In the studies carried out in this context, it was found that the beef of organic animals have lower fat, saturated fatty acids and cholesterol contents and higher omega-3 and conjugated linoleic acid (CLA) levels than those of the conventionals (Hansson et al. 2000, Revilla et al. 2008, Hanoğlu et al. 2009).

One of the first examples of organic animal husbandry in Turkey is the project carried out in the villages of Ayvacık County in Çanakkale where native

breeds including Turkish grey cattle are raised instead of culture breeds which cannot be raised economically due to field conditions.

In this study, potential sustainable use of Turkish grey cattle from the native domestic genetic sources in organic husbandry and Ayvacık Organic Beef Production Project as a model were examined.

#### Principles of Organic Cattle Husbandry

The basis of organic livestock production consists of four principles, including the use of native breeds which have adapted to the region they were raised and resistant to diseases, appropriate shelter conditions, healthy animal husbandry (animal welfare) and feeding with organic feeds (Gibon et al. 1999; Woodward and Fernandez 1999; Hovi 2001 ).

The principles of organic animal production according to the Regulation on Principles and Practices of Organic Agriculture, rearranged according to EU legislation and published on 18 August 2010 in Official Journal No. 27676 of (Anonymous 2010) are listed below:

- In organic farming, breeds which are highly adaptable to environmental conditions and are disease resistant are selected. For this reason, priority is given to native breeds and hybrids that have adapted to the region.
- For breeders, animals that are fed completely with organic feed, and not genetically modified, resistant to weather conditions and diseases are used.
- Natural methods are used in reproduction. Nevertheless, artificial insemination is also permitted. Cloning and embryo transfer are not used.
- Animals should have access to pastures, grasslands and open-air promenades or open spaces.
- Animals are primarily fed with roughages and concentrate feeds obtained from the organic farms they were raised in. Dry matter content of the forages in the ration should be at least 60%.
- Young animals are primarily fed with mother's milk. The minimum time period is 90 days.

- Antibiotics and other growth or production promoting substances cannot be used in animal nutrition.
- Application of chemical nitrogen fertilizer on organic farming fields is prohibited. Inputs which are not permitted in the legislations against plant diseases, pests, nematodes and weeds cannot be used.
- Feeds containing GMO, food additives, plant protection products, fertilizers and animal health products cannot be used for organic farming.
- Preventive medicine is essential in organic animal health. Despite all the preventive measures in case of illness or injury, animals are isolated in a suitable shelter and treated.
- Chemically synthesized veterinary medicinal products or antibiotics cannot be used in disease preventive applications.
- In treatment, instead of chemically synthesized allopathic veterinary medicinal products or antibiotics, products which are allowed in the legislation and phytotherapeutic products are used.
- Animals are not kept tied.
- Making animal shelters is not mandatory in regions where climatic conditions are suitable for animals to live outdoors.

#### Plant Production in Ayvacık County

The area of the field located within the boundaries of Ayvacık county is 90.130 hectares. 46.821 hectares of this field are forest, 34.540 hectares are agricultural land and the remaining 8,769 hectares are pasture and barren lands (Table 1). 22.336 hectares of agricultural field are devoted to vineyards and orchards, and 12.204 hectares are devoted to agricultural fields. In one-third of agricultural fields (12.200 ha), olive cultivation is carried out and 90% of the farmers in 33 villages are involved in olive cultivation. However, olive cultivation is mostly carried out in sloping lands which are not suitable for processed farming. Cereals, various vegetables and fruits are the most grown products in the areas of processed farming.

**Table 1.** Land use/cover area in Ayvacık county

| Land use /cover types        | Coverage area (hectares) | Distribution rate (%) |
|------------------------------|--------------------------|-----------------------|
| Forest area                  | 46.821                   | 52                    |
| Agricultural land            | 34.540                   | 39                    |
| Permanent meadow and pasture | 5.360                    | 6                     |
| Scrub lands                  | 3.409                    | 3                     |
| Total land                   | <b>90.130</b>            | <b>100</b>            |

Reference:<http://www.canakkale-Ayvacic.gov.tr/sayfa.asp?lid=20120409201923>

**Table 2.** Number of cattles according to years in Ayvacik county (head)

| Years | Cattle - Culture | Cattle - Cross-bred | Cattle - Domestic | Total number of cattle |
|-------|------------------|---------------------|-------------------|------------------------|
| 2003  | 525              | 985                 | 5.172             | 6.682                  |
| 2004  | 555              | 1.028               | 5.240             | 6.823                  |
| 2005  | 1.835            | 1.766               | 3.410             | 7.011                  |
| 2006  | 1.850            | 1.754               | 3.381             | 6.985                  |
| 2007  | 525              | 985                 | 3.857             | 5.367                  |
| 2008  | 1.886            | 1.009               | 3.975             | 6.870                  |
| 2009  | 2.309            | 1.152               | 5.175             | 8.636                  |
| 2010  | 3.043            | 1.284               | 4.853             | 9.180                  |
| 2011  | 3.826            | 1.537               | 5.329             | 10.692                 |
| 2012  | 4.293            | 1.946               | 5.950             | 12.189                 |
| 2013  | 4.258            | 1.797               | 6.022             | 12.077                 |

Reference: <http://tuikapp.tuik.gov.tr/hayvancilikapp/hayvancilik.zul>

### Cattle Breeding in Ayvacik County

According to Turkish Statistical Institute (TSI) data by the end of the year 2013, the number of cattles in Ayvacik county is 12.077 and the native breeds constitute 50% of this cattle population (Table 2). In the last decade, the increase in native breeds of cattle was only 15%, while the culture breeds increased by 8 folds.

The main reasons for the continuing of native breed cattle to the present day in Ayvacik county are as follows; the native breed livestock has become traditional, animals require less care, shelter needs are less, feeding on pasture without supplementary feeding is possible almost throughout the year, low labor costs due to breeding for beef rather than milk, cattle breeds with higher live weight cannot benefit from the fields in the region.

### General Properties of Grey Cattles

Turkish grey cattle is the common native breed of the Balkan countries. This breed once was spread from Thrace Region to Sivrihisar in Turkey and they are currently raised in small herds in the region to the south of Marmara Sea and mountainous areas of Thrace Region.

Color of male Turkish grey cattle ranges from light silver to dark ash and males are darker colored than females. Their live weight ranges from 250 to 400 kg and their milk yield in lactation is 1000-1500 kg. The daily live weight gain is 700-800 grams during fattening.

Turkish grey cattle yield is not lower than the other domestic breeds. However, because the area where they are raised is economically more developed than the other regions, the disposition speed of this breed is higher than other native breeds. In addition, due to the widespread use of agricultural machinery, the possibility of use of grey breed as ox is eliminated.

Turkish grey cattle has a highly developed digestive system resistant to sudden changes in feeding. Low quality feeds can be utilized. They are very resistant to diseases and pests as well as any adverse natural and climatic conditions (Anonymous 2009).

Their living areas are often forest interiors and rough terrains in mountainous areas. They are capable of living, feeding and breeding in such areas without human intervention (Anonymous 2009). They spend almost half of the year semi wild as free herds in the lands, except in areas with very harsh winter conditions. Therefore, the costs that the breeders face for these animals are almost negligible.

### Properties of Grey Cattle Breeding in Ayvacik County

**Breeding:** Turkish grey cattle living in unqualified areas under trees and shrubs in the private properties is raised and protected under organic livestock production. Livestock in villages where the project is implemented is done in the form of extensive livestock.

Animals mate in their natural environment without any intervention. Mating generally takes place in spring. Therefore, calving occur in winter months. Likewise, calving takes place without any intervention. Nurturing animal lifts up and breastfeeds the calf and keeps it in a bush in the field or at a secluded spot in the forest to protect it from dangers. This period sometimes may last up to 4-5 days.

Conventionally grown beef cattle can become suitable for slaughtering in 8-10 months, while Turkish grey cattle raised in Ayvacik organic beef production project becomes suitable for slaughtering approximately in 26 months.

**Feeding:** Animals are raised in a completely natural environment. The animals graze in pastures surrounded with natural fences and meet their water needs from the creek in the field. Animals are fed from April to July with legumes (*Trifolium* and *Medicago* species),

grasses (*Lolium* and *Bromus* species) and herbaceous plants from other families (*Crepis* and *Bellis* species) which are unique to the region. One-third of the project area is covered with shrubs (phillyrea, blackthorn, cyprus oak, cermes oak and thyme). In the summer (especially in the period of dry herbaceous species), animals change their feed preferences in favor of shrubs (Gökkuş 2013) among which thyme makes the meat produced in the region different in terms of its flavor that it adds in the meat (Keskin 2008). In snowy and very cold days during winter, animals are fed with dried herbs that are reaped and dried from pastures during spring.

**Health protection:** Turkish grey cattle are resistant to any adverse nature (field, climate) conditions and under-nutrition due to their sturdy and strong body structures, which makes them to have a high resistance to pests and diseases and they recover very quickly if they fall ill (Anonymous 2009). Therefore, no veterinary medicinal product applications are made except extraordinary situations.

#### Ayvacık Organic Beef Production Project

One of the first examples of animal husbandry depending on natural pastures with no chemical use in Turkey is the project carried out in the villages of Ayvacık County in Çanakkale which is a county where culture breeds cannot be raised economically due to field conditions as explained above and native breeds including Turkish grey cattle are raised.

Initially, the project started with 1.703 animals with 60 breeders in 8 villages and become widespread with the establishment of Turkey's first and only Organic Beef Producers Association in February 2010. Today, with the participation of 76 breeders, it turned to an activity carried out in 22.345 decares with 2.825 animals. Offering the animals in organic status to be marketed at a 35% higher market price than the normal carcass market prices has helped the breeders which have no other income source other than animal husbandry to find buyers for their products at higher prices and allowed them to return to livestock.

Before the implementation of the project, Turkish grey cattle breeders that cannot produce enough income from their only source of income, sale of beef, had to give up farming or had to do hybridization with the culture breed cattle in order to improve beef production. This process has accelerated the extinction of the breed. Sustainability of efforts for the conservation of animal genetic resources is possible with gaining economic value of the products that belong to these gene sources. With the transition to organic farming, the sustainability of Turkish grey cattle has become possible with a good promotion and marketing strategy, following the emerging surplus values of this breed.

Natural farming carried out in the region for many years has facilitated the transition to organic farming. Also, many characteristics specific to the common Turkish grey cattle of the region facilitated the compliance with the fundamental principles of organic farming.

#### **Conclusion**

Beef cattle livestock carried out in the region was observed to have suitable characteristics to the principles of organic farming. The most important of these characteristics can be listed as, *i*) livestock is carried out in the region with native breeds and with their hybrids, *ii*) availability of meadows and pastures throughout the year and the presence of adequate amount of grazing areas, *iii*) no limitations for the period of calves feeding with milk, *iv*) natural means of reproduction and *v*) no applications such as horn blunting.

Ayvacık organic red beef production project revealed that the sustainability of studies on animal genetic resources conservation is possible with the economic value gaining of the products. In this manner, with the transition to organic farming, the sustainability of Turkish grey cattle has become possible with good promotion and marketing strategies.

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