La typologie de explorations agricoles aux Açores

EMILIANA SILVA* , JULIO BERBEL**

Abstract

The objective of this paper was to define types of Azorean farms from a panel data of 174 farms of The European Database of Farm Accountancy Data Network of the Azores, Portugal. This study used cluster analysis, the Ward method. The results allowed the identification of three types of grazing systems of farms as follows: 1) extensive grazing systems (less than 1.4 cows per hectare); 2) moderate intensive grazing system (1.4 to 2.4 cows per hectare); 3) intensive grazing system (more than 2.4 cows per hectare) and three types of animal specialization: 1) beef farms system (more than 0.66); 2) mixed farms system (0.33 to 0.66); dairy farms system (less than 0.33). This enables to define seven types of Azorean farms.

Keywords: Cluster, Ward, Typology, Grazing Systems

Résumé

Ce travail a pour but la définition de la typologie d’exploitations agricoles aux Açores. Cette étude fait appel à 174 exploitations de la base de données européenne du Réseau d’Information Comptable Agricole des Açores, Portugal. Ce travail a utilisé l’analyse par groupe, la méthode de Ward. Les résultats ont permis l’identification de trois systèmes comme suit : 1) le système de pâturage extensif (moins de 1.4 vaches par hectare); 2) le système de pâturage modéré (1.4 à 2.4 vaches par hectare); 3) le système de pâturage intensif (plus de 2.4 vaches par hectare) et aussi trois systèmes de spécialisation animale : 1) le système de production de viande (plus de 0.66); 2) le système mixte (0.33 à 0.66); et 3) le système de production laitière (moins de 0.33). Cela nous permet de définir sept types d’exploitations agricoles aux Açores.

Mots clé: Groupe, Ward, Typologie, Systèmes de pâturage.

Jel classification: Q 120
farms less dairy cows by total of animals. When specialization is higher than 0.66, it is a beef farm; when lower than 0.33, it is a dairy farm, and between 0.33 and 0.66, it is a mixed farm. 4) Intensity variable (Total cows/Hectare).

The cases cluster allows to define a typology of Azorean dairy farms, which means a group of farms with similar characteristics. Following the definition and the selection of the variables by cluster in four groups, the next step was to form the farms cluster. After finding the initial clusters, some limits of intensification, specialization and dimension were forced, because of the diversity of farms in each cluster.

3. Results and discussion

The variable cluster formed four clusters of variables: Cluster I - Cluster of dimension (agricultural area; total number of animals); Cluster II – Cluster of outputs and fixed and variable assets (subsidies per cow; net income per hectare; beef sales per cow; fertilizer costs per hectare, feeding costs per cow, and rent per hectare); Cluster III – Cluster of specialization, outputs and fixed assets (specialization, milk sales and hired labor per hectare); and Cluster IV – Cluster of intensity and fixed and variables assets (intensity, depreciation, fuel and lubricants per hectare, machinery and buildings repairs per hectare and other cash expenses).

3.1. Results

As a result of an intensive grazing system, cluster III provided higher net profit per cow (833 euros), and cluster II provided smaller net profit per cow (397 euros). This result was similar for the gross margin per hectare. The net profit and gross margin for cluster III was influenced by the higher milk production per cow, which was about 6000 liters. Cluster II presented a higher expenditure on the animal feeding with concentrates (around 340.6 Euros), when compared with the other two clusters (more intensive grazing systems).

The expenditures in wages was more elevated (90.28 Euros) in cluster II, mainly composed of S.Miguel farmers. In this island, around 20% of farms had agricultural workers. In Terceira, about 90% of farms are family run.

As a result of a forcing cluster, it was decided that the specialization and grazing intensity define the groups of farms (Figure 1). As it is observed in this figure, dairy farms (specialization smaller than 0.33) are mainly of the cluster II and III. Cluster I had only one farm of beef production (specialization higher than 0.66). Most of the sampled farms are mixed or with dairy specialization. Cluster III is more intensive, and most farms are intermediate (around 2 cows per hectare); clusters I and II are less intensive grazing systems (less than 2 cows per hectare). Also, as observed in figure 1, there are not very limited groups of farms, this means that, independently of the level of intensive grazing systems, there are dairy and beef farms and it is necessary to delimit those groups. For example, dairy milk farms (specialization less than 0.33) are in extensive grazing system (less than 1.4 cows per hectare), in the medium system grazing (between 1.4 and 2.4 cows per hectare) and in the intensive grazing system (more than 2.4 cows per hectare) Because of these reasons it was considered necessary to force the clusters according the intensity of grazing for obtaining more homogeneous farms. Then it was decided to force groups of farm

<table>
<thead>
<tr>
<th>Table 1. Composition of farm groups per island</th>
<th>Terceira</th>
<th>S.Miguel</th>
<th>Total</th>
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<tr>
<td>Clusters</td>
<td>Nº</td>
<td>%</td>
<td>Nº</td>
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<tr>
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<td>81.4</td>
<td>11</td>
</tr>
<tr>
<td>II</td>
<td>17</td>
<td>37.8</td>
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</tr>
<tr>
<td>III</td>
<td>45</td>
<td>66.2</td>
<td>23</td>
</tr>
<tr>
<td>IV</td>
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<td>100</td>
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<td>V</td>
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Table 2. Cluster characteristics of Azorean farms per cluster

| | Cluster I | Cluster II | Cluster III |
|-----------------------------------------------|----------|-----------|
| Agricultural area (ha) | 20.5 | 23.5 | 15.5 |
| Total Cows | 37.4 | 39 | 36.4 |
| Total Cows/ Agriculture area (ha) | 1.9 | 1.7 | 2.4 |
| Net income/area(euros) | 508.77 | 397.00 | 830.00 |
| Gross margin/Milk cows(euros) | 822.51 | 755.42 | 1004.58 |
| Liters of milk/ cow | 4202.9 | 5078.2 | 5989.9 |
| Feed /Milk cows (euros) | 185.55 | 340.68 | 236.93 |
| Fertilizer/ha (euros) | 110.73 | 151.14 | 181.06 |
| Hired labor /ha (euros) | 26.44 | 90.28 | 43.89 |
according to intensity systems grazing: 1) less than 1.4 cows per hectare; 2) 1.4 and 2.4 cows per hectare; and 3) more than 2.4 cows per hectare; and according to milk specialization: 1) less than 0.33; 2) 0.66 and 3) more than 0.66.

Type I – Intermediate grazing systems (1.4 to 2.4 cows per hectare) and mixed system (specialization 0.33 to 0.66).

Type II – Intermediate grazing systems (1.4 to 2.4 cows per hectare) and dairy system (specialization less than 0.33).

Type III – Extensive grazing systems (less than 1.4 cows per hectare) and mixed system (specialization 0.33 to 0.66).

Type IV – Extensive grazing systems (less than 1.4 cows per hectare) and dairy system (specialization less than 0.33).

Type V – Extensive grazing systems (less than 1.4 cows per hectare) and beef system (specialization more than 0.66).

Type VI – Intensive grazing systems (more than 2.4 cows per hectare) and dairy system (specialization less than 0.33).

Type VII – Intensive grazing systems (more than 2.4 cows per hectare) and mixed system (specialization 0.33 to 0.66).

4. Conclusion

The Azorean animal production has mainly three types of farms; extensive grazing systems (dairy, beef or mixed), intensive grazing systems (dairy and mixed) and intermediate grazing systems (dairy and mixed). This allows the development of agricultural policies for a specific group of farmers with different needs, and the development of useful decision models as in the example on the simulation of the effect of an increasing price of feeding (concentrates) and fertilizers on the net profit of different types of farm (intensive, extensive and moderate).

References