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**Kukovics S., Molnar A., Safar L., Javor A.**

*in*

**Gabiña D. (ed.).**
**Strategies for sheep and goat breeding**

**Zaragoza : CIHEAM**
**Cahiers Options Méditerranéennes; n. 11**

**1995**
pages 67-78

# Development of the infrastructure in small ruminant breeding programmes; the organization of breeding and commercial flocks

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***SUMMARY*** *- There are two types of flocks in the Hungarian sheep industry. The breeding programmes are going on in the breeding/registered flocks and their results are also used on the commercial farms. The breeding flock of the sheep industry consist of 100 farms with more than 50,000 ewes belonging to twenty different breeds and some crossbreds.*

*Almost 7,000 sheep flocks can be found in Hungary and the most important data of the studied 634 farms are evaluated.*

*The infrastructure and the organizations of both types of farms along with the breeds, breeding programmes, flock sizes and status of properties, management, genetic improvement programmes and financing data are presented.*

***Key words:*** *sheep breeds, breeding programmes, management breeding and commercial flocks.*

## THE INFRASTRUCTURE AND ORGANIZATION OF BREEDING FLOCKS

The number of sheep dramatically decreased in Hungary between 1983 and 1993. Not just the total No. of sheep (from 3.4 millions to about 1.5 millions), and the No. of ewes (from 2.4 millions to about 0.96 million), but the number of registered ewes also reduced.

### Breeds and breeding programmes

In the beginning of 1995 there are 20 purebred breeds and some crossbred populations belonging to the breeding flock of the Hungarian sheep industry. They are fully registered and representing different programmes (Table 1.). As the biggest

part of the national sheep flock is Hungarian Merino (about 90-92 %), so this breed is also dominating within the registered flocks. There are 100 registered flocks with more than 50,000 ewes. Two groups of breeds could be distinguished: Hungarian and imported ones. In the Hungarian breeds consist of Merinos (Hungarian and Fertile Merino) and rare or gene reserve breeds (Cikta, Cigája and Racka). The Bábolna Fertile Sheep is also Hungarian one, but it is a hybrid based on Hungarian Merinos and imported breeds (Finish Landrace, Romanov, Ile de France-and Suffolk).

The imported breeds arrived from European countries, and from Australia, New Zealand and Israel.

There are four main breeding group and programmes at present in Hungary: the Merino group (along with the Corriedale and Romney sheep); meat group; milk group (with a part of Cigaja breed) and the rare breeds group.

**The size of flock and status of property**

There were a big reduce in the number of registered ewes between 1983-1993 (Table 2), almost only one third of the population left. Most of the registered ewes were kept in cooperative farms (72.1 %), less than one third was in the state farms and only 2 % of them were bred in private flocks in 1983. Ten years later the cooperative farms were still at the first place on the rank, but the private farms came up to the second place and new category was created and the state property was driven back to the last place.

Regarding the size of the flocks a quite wide range could be observed in 1983 and the biggest number of flocks were belong to the categories having 1,001-2,000 (31.2 %) and 501-1000 (22.9 %) heads. Ten years later the biggest number of flocks were in two categories: 1-100 (26.6 %) and 201-500 (26.6 %).

**Management**

The management on the breeding farms is the same in general as it is on the commercial ones (except the performance recording) so the details will be summarized later on.

**Genetic improvement programmes**

During the last 4-5 years the most important objective was to keep up the registered flocks, they were really in danger. Luckily, the number of registered flocks /and ewes/ are increasing again in the beginning of 1995.

The principal objectives on the nucleus/stud farms are to keep up the purebred populations (in some cases to increase their flock size and the number of breeding ewes), to improve their most important characters and to produce breeding rams for other flocks-partly for transferring genetic material to purebred populations and partly for crossbreeding in commercial flocks.

Selection is mainly used in purebred flocks but there are two breeds where the crossbreeding for improving fecundity was/and is utilized /Fertile Merino: Hungarian Merino x Booroola Merino; Bábolna Fertile Sheep: (H.Merino x Romanov x Finish Landrace) x Ile de France/. Crossbreeding for improving meat production in the Merino group could also be observed.

The characters to be improved:

In Merino production: weaning weight; body weight in one year of age; shearing weight; fibre diameter; staple length; body conformation and prolificacy.

In meat breeds: lambing rate, weaning weight; lean meat production body conformation.

In milk breeds: lambing rate, weaning weight, milk yield, lactation length, and milk components (fat %; protein %).

The methods of selection is based on two things: minimum parameters and selection indices calculated from the most important traits. Each breed has its own minimum parameters and the indexes used up to now are as follows:

Ewe indexes

| | |
|---|---|
| Merinos | I = 0.33 CLW + 0.67 CFW |
| Meat sheep | I = 1.00 CLW |
| Milk sheep | I = 0.67 CLW + 0.33 CMW |

Hogget ram indexes

| | |
|---|---|
| Merinos | I = 0.043* ADG + 22* CFW + 0.37 sire index + 0.28 clam index |
| Meat sheep | I = 0.043* ADG + 0.52 sire index + 0.42 dam index |
| Milk sheep | I = 0.043* ADG + 0.52 sire index + 0.42 dam index |

Adult ram indexes

| | |
|---|---|
| Merinos | I = 20* CFW + 0.35 daughters index + 0.27 FPPT+ 0.17 CPPT + + 0.15 FPPT |
| Meat sheep | I = 0.50 daughters index + 0.27 FPPT + 0.18 CPPT |
| Milk sheep | I = 1.0 daughters index |

Corrected lamb weight (CLW)= lamb weaning weight corrected according to the weight and age at weaning and age of dam and the whole is corrected to 365 days

Corrected fleece weight (CFW)= clean fleece weight corrected according to the staple length, fibre diameter, body weight, and age, and the whole corrected to 365 days.

Corrected milk weight (CMW): milked milk yield corrected according to standard (6%) fat content and the whole is corrected to 156 days.

| | |
|---|---|
| ADG: | average daily weigh gain of lambs up to weaning |
| FPPT: | result of the progeny performance test on the farm in fattening |
| CPPT: | result of the central progeny performance test in fattening |
| FPPT: | result of the fleece performance test of the progenies |
| *: | absolute value compared to the breed standard. |

There are new indexes being created for ewes in meat and dairy breed programmes:

$$\text{Ewe index (meat)} = \frac{\text{Sum of the corrected and weighted body weight of the lambs}}{\text{No. of weaned lambs}} \times \text{Weighting factor}$$

Ewe index = 0.6 x dairy index + 0.4 lamb index
(dairy)

Dairy index = created from milk yield (with fat %; protein %); length of milking period; length of suckling period; weaning weight

Lamb index = created from lambing rate; weaning rate; weight gain up to weaning,

The computer tomograph will be used in estimating breeding value of meat breed rams in the near future.

The genetic evaluation of different flocks is based on the selection indexes and self performance tests (daily weight gain, wool production, milk production) as well as the progeny performance tests (daily weight gain - central and farm test; wool and /or milk production - farm test)

The AI is only used in the 10-15 % of the flocks and its utilization is highly depending on the flock size. The natural service "from hand" and the harem mating are commonly used on the farms. The annual lambing system is dominating on the registered farms but some of them run with frequent and/or divided lambing.

**Available infrastructure**

As it mentioned before there are 100 registered sheep flocks on almost 100 different farms out of which 21 are meat-, 10-10 are dairy and rare breed farms and the others are belong to the Merino groups. All of them is interested in to get more and more income but only few of them is ready to be involved in a breeding programme. One might say "the today is still much more important than the tomorrow or day after tomorrow", the surviving is still difficult problem.

The housing of the animals is acceptable, the lands, barns and other facilities could allow to make breeding programmes on most of the farms.

There are no really directs laboratories and offices available now for a breeding programme, but the Research Institute for Animal Breeding and Nutrition along with the three out of the five Agricultural Faculties of different universities are involved in all of the programmes going on in Hungary nowadays. The farms could receive scientific and technical support from these institutions for their developing works.

Two organizations should be mentioned regarding breeding programmes: the Hungarian Sheepbreeders' Association which organizes the breeding work and the self- and progeny performance tests as well as the National Institute for Agricultural Quality Control, as the Authority who supervise all of these works. Eleven regional engineers and technicians are working for the Association and there are six engineers involved in sheep breeding in the Authority mentioned above. These people are visiting the farms following the agreed program and collecting the data - on computers - which are processed in the centre of these organizations.

**Financing of activity**

Developing or making breeding programmes is quite costly activity. The farms could received a very limited financial help to their work. The Research Institute and the university faculties have narrow governmental supports and some awards from different foundations to be able to contribute in this kind of programmes. The Authority is working on a strict governmental budget, while the Association is utilizing some awards along with the members` fee.

The evaluation of costs is a very difficult task. It is not possible to make an exact work because the costs are mixed and not easy to distinguish them properly. It is mainly happened as the consecuence of the budgetary changes in the institutions since 1990.

## THE ORGANIZATION AND INFRASTRUCTURE OF COMMERCIAL FLOCKS

There are three main organizations in the Hungarian sheep industry: regional and breed societies, Sheep Products Council and the Hungarian Sheepbreeders` Association. The last one represent and organizes only the breeding work in registered flocks. The middle one is representing and organizing the whole industry from the producers over the processing industry up to the trade. The first ones are organizing the commerce of products and breeding stock of special groups of farms. The Association and the Council are trying to get special subsidies for the stud/ nucleus breeders and all of the organizations are aiming to follow the improvement programmes. The Council wants to improve the quantity and the quality of the products from which the meat (lamb) is the most important. A new monitoring system is being created now which includes 50-100 different farms having different sizes of sheep flocks based on same surveys covering all of the farms or only the determined percent of them.

The production system is very similar if not the some in the commercial flocks as in the breeding flocks, some of the most important information are being presented based on the data of a survey.

### Flock size and breeds

Some 13 hundred farms were included in this study, seven hundred answers arrived back and 634 of these were suitable for the evaluation, representing 95,071 ewes in nine categories of flock sizes. These data are covering about 10 % of the producing part of the sheep industry.

The flock size categories, the number of farms and ewes are shown in Table 3. There are some differences between the data of Table 2 and 3, mostly because some registered ewes got into different farms (mainly to small ones) as the consequences of privatisation and reorganization and not all of these represent registered flocks at the same time.

The breed structure is summarised in Table 4. The Merinos are highly dominating in each category followed by the meat breeds, Cigaja, dairy breeds, Racka and the others.

### Status of property and land used

In the smaller categories only private ownership can be found, while in the highest categories the cooperative farms are dominating. The biggest part of the animals is belonging to the owner of the farm, very limited number of farms run with rented ewes and several of them have mixed (own plus rented) sheep (Table 5). The picture is a little bit different regarding the ownership of the sheepbarns, however, the biggest part of the farms have their own barns, and many of them utilize rented buildings.

The size of the land is extremely changing within the categories (Table 6) apart from the ownership of the land. Similar diversity could be observed regarding the size of arable land or the pasture.

**Management of the farms**

One of the most important work on the sheep farm is the reproductive activity. There are three distinguishable lambing seasons utilized on the farms along with a small fourth one (Table 7.) The most important is between December - and February, followed by the October-December, May-June and the others.

Annual, annual but divided and frequent lambing systems are used on the farms and sometimes the divided-frequent lambing can also be observed. As the size of flock is increasing the percentage of the annual lambing is decreasing and the importance of divided and frequent lambing become higher and higher (Table 8.)

Mainly the natural service is utilized in the flocks and the AI can only be observed on the farms belonging to the higher categories. In the small flocks mainly the own rams used. As the size of the flocks is increasing the ratio of the own rams reducing along with the growing importance of registered rams originated from stud/nucleus flocks. The ratio of other rams - there are changed between farms - give a quite different picture (Table 9.)

All of the sheep are grazed, but winter time they are mainly indoors. The lambs are reared indoors on pelleted concentrates while the ewes receive hay, silage and concentrates. Only the big farms with large flock of sheep are able to produce enough feed for their animals (Table 10.). A little bit more than one fifth of the flocks receive purchased feed. Dominating part of the flocks get only self produced concentrates and forages, while a changing ratio of the flocks receive feed from mixed resources.

Not only the dairy sheep or the milk type crossbreds, but the Merino ewes are milked in Hungary and the last one has the biggest numbers. The milk (dairy) production has no importance in small flocks - except the purebred dairy ones - but on some of the farms with medium and big flock size the milking of sheep is common. About 10-15 % of the ewes are milked. Milking machines are used mainly on big farms, while the smaller ones run with hand milking.

Most of the small farms are functioning with family labour (Table 8.) and its ratio reduces under 17 % above 1.000 heads of ewes. Numerous farms utilize temporary labour around lambing, weaning and shearing time along with the family members. Above 1,000 heads of sheep the employees have the dominating role within farm labour.

**Improvement programmes and organizations**

On the average farms the genetic improvement means to get registered breeding rams from stud/nucleus farms and their progenies will be the replacement. Direct selection programmes improving one or two traits could hardly be observed on commercial farm, however, home made register and breeding programme are going on some bigger farms.

Many farms are run after of their own ideas and acting individually on the meat market and searching for the suitable breeding stock. Biggest part of the farms was reorganized during the last 4-5 years and many ewes left the previous organizations. The new organizations were created during the last two-three years and trying to cover all of the producing sector of the sheep industry.

From the trade point of view the most important is the Council membership. The ratio is higher in some cases as it can be seen in Table 11, because the membership of many farms is organized via the Association.
The societies have significant role in the genetic improvement within their farms serving them with the best quality stock and the continuous qualification of their products.

These organizations are financed from the member`s fee and the two national organization receive governmental support and get awards from the Animal Breeding Foundations.

## ABOUT GOATS

There are about 30-35,000 heads of goat from different breeds in Hungary. Most of these animals are kept in sheep flocks nursing orphan and other lambs. Some 3-4,000 heads are kept in pure goat herds.

The biggest number of these animals belong to the Hungarian Native Goat breed, only a couple of hundreds are purebreds (Sanen, Alpin, Toggenburg, Bayern Brown).

No official register is functioning along with the goat herd, however, some farmers are using home made register. There are some societies but they do not register their goats and their performances yet. This situation will hopefully be improved during the next two years as these societies and breeders joint to the network of the Association and be able to make the proper registers and performance tests.

## RESULTS OBTAINED

The biggest and the most important result is that the sheep industry survived during the last half decade. New organizations were created (societies, Association, Council) which are covering the big and increasing part of the whole industry. The authority was reorganized and it seems that the consolidation of the structures is slowly being finished.

The other benefits could be established only in the future.

Table 1. Registered purebred sheep in Hungary (February 1995)

| Breds | No. of ewes | Origin of breeding stock |
|---|---|---|
| Hungarian Merino | 37500 | |
| Australian Merino | 110 | Australia - New-Zealand |
| Fertile Merino | 2200 | |
| Booroola Merino | 40 | New-Zealand |
| Corriedale | 600 | New-Zealand |
| Romney | 230 | New-Zealand |
| Bábolna Fertile Sheep | 1400 | |
| Ile de France | 550 | France |
| German Mutton Merino | 2570 | BRD |
| German Blackheaded Mutton Sheep | 550 | BRD |
| Suffolk | 500 | USA, UK |
| Texel | 150 | The Netherland |
| Awassi | 440 | Israel |
| British Milksheep | 160 | UK |
| East Friesian | 30 | BRD |
| Lacaune | 50 | France |
| Cigája | 800 | |
| Cikta | 200 | |
| Hortobágy Racka (black, white) | 1500 | |
| Transilvanian Racka | 50 | |
| Registed milk type crosbreds | 2500 | |

Table 2. Size of registered flocks and status of property

| | 1983 | 1993 |
|---|---|---|
| No. registered ewes (heads) | 130400 | 48000 |
| | | |
| Status of property (%) | | |
| State Farms | 28.8 | 15.6 |
| Cooperative Farms | 71.2 | 37.5 |
| Ltd-s, Societies, Holdings | - | 21.9 |
| Private farms | 2.0 | 25.0 |
| | | |
| Flock size (No. ewes) % | | |
| - 100 | 5.5 | 26.6 |
| 101 - 200 | 9.2 | 13.9 |
| 201 - 500 | 15.6 | 26.6 |
| 501 - 1000 | 22.9 | 17.7 |
| 1001 - 2000 | 31.2 | 15.2 |
| 2001 - 5000 | 12.9 | - |
| 5001 - | 2.7 | - |

Table 3. The number of farms and ewes in the study

| Flock size | No. of farms | No. of ewes | % of reg ewes | No. farms with reg. ewes | No. of ewes | % of reg ewes |
|---|---|---|---|---|---|---|
| 1 - 20 | 138 | 1932 | 18.48 | 30 | 459 | 77.78 |
| 21 - 50 | 184 | 6298 | 10.37 | 28 | 879 | 74.29 |
| 51 - 100 | 117 | 9077 | 10.22 | 19 | 1379 | 67.30 |
| 101 - 200 | 96 | 13875 | 8.50 | 12 | 1865 | 63.22 |
| 201 - 300 | 35 | 9078 | 6.06 | 2 | 550 | 100.00 |
| 301 - 500 | 30 | 12169 | 3.49 | 2 | 834 | 50.96 |
| 501 - 1000 | 20 | 13685 | 7.45 | 3 | 2010 | 50.75 |
| 1001 - 3000 | 12 | 20992 | 5.93 | 2 | 2780 | 44.78 |
| 3001 - | 2 | 7965 | 67.93 | 2 | 7965 | 67.93 |
| Total | 634 | 95071 | - | 100 | 18721 | - |

Table 4. The breed structure (%)

| Flock size | Merinos | Meat sheep | Milk-sheep | Cigája | Racka | Others |
|---|---|---|---|---|---|---|
| 1 - 20 | 87.71 | 5.00 | 0.30 | 3.46 | 1.24 | 7.53 |
| 21 - 50 | 84.20 | 3.33 | 2.53 | 3.29 | 0.60 | 5.50 |
| 51 - 100 | 82.12 | 6.08 | 0.65 | 12.90 | 3.23 | 2.06 |
| 101 - 200 | 76.42 | 8.13 | 0.81 | 9.76 | 0.81 | 4.07 |
| 201 - 300 | 87.26 | 4.71 | 0.00 | 4.57 | 2.31 | 1.14 |
| 301 - 500 | 80.66 | 10.52 | 1.38 | 3.97 | 1.07 | 2.41 |
| 501 - 1000 | 64.63 | 10.53 | 4.21 | 15.37 | 0.00 | 5.26 |
| 1001 - 3000 | 90.42 | 9.17 | 0.00 | 0.00 | 0.00 | 0.42 |
| 3001 - | 97.50 | 0.00 | 2.50 | 0.00 | 0.00 | 0.00 |

Table 5. The status of property (animals and barns) (%)

| Size of flock | Animals | | | Barns | | |
|---|---|---|---|---|---|---|
| | Own | Rented | Mixed | Own | Rented | Mixed |
| 1 - 20 | 100.00 | - | - | 94.31 | 1.63 | 4.07 |
| 21 - 50 | 100.00 | - | - | 92.38 | 2.34 | 4.68 |
| 51 - 100 | 100.00 | - | - | 81.74 | 6.09 | 12.17 |
| 101 - 200 | 96.88 | - | 3.12 | 82.62 | 9.78 | 7.61 |
| 201 - 300 | 94.14 | - | 2.86 | 82.35 | 11.76 | 5.88 |
| 301 - 500 | 80.00 | 3.33 | 16.67 | 62.07 | 31.03 | 6.90 |
| 501 - 1000 | 80.00 | - | 20.00 | 65.00 | 35.00 | - |
| 1001 - 3000 | 75.00 | - | 25.00 | 83.33 | 16.67 | - |
| 3001 - | 100.00 | - | - | 100.00 | - | - |

Table 6. Land used according to different flock size

| Flock size (heads) | Private property (ha) | | Rented land (ha) | | Arable land (ha) | | Pasture (ha) | |
|---|---|---|---|---|---|---|---|---|
| | x | s | x | s | x | s | x | s |
| 1 - 20 | 5.2 | 7.5 | 2.9 | 12.7 | 3.9 | 7.7 | 1.1 | 3.9 |
| 21 - 50 | 6.8 | 9.5 | 2.4 | 6.7 | 5.6 | 13.4 | 5.4 | 28.3 |
| 51 - 100 | 15.6 | 19.1 | 10.1 | 21.9 | 9.9 | 13.9 | 10.5 | 18.0 |
| 101 - 200 | 16.4 | 24.8 | 24.2 | 101.3 | 19.5 | 77.0 | 13.7 | 26.2 |
| 201 - 300 | 36.7 | 33.6 | 101.9 | 370.6 | 26.3 | 70.5 | 44.5 | 67.6 |
| 301 - 500 | 31.3 | 51.6 | 254.9 | 831.3 | 33.5 | 63.3 | 65.4 | 77.6 |
| 501 - 1000 | 376.1 | 1349.3 | 111.5 | 182.8 | 345.5 | 1159.8 | 108.1 | 146.2 |
| 1001 - 3000 | 1437.0 | 2572.7 | 921.1 | 1671.4 | 1290.3 | 1817.4 | 287.4 | 311.4 |
| 3001 - | 2150.0 | 3040.6 | 4000.0 | 2828.4 | 2000.0 | 2828.4 | 2250.0 | 1060.7 |

Table 7. The utilized lambing seasons (%)

| Flock size | December-February | May-June | October-December | Other |
|---|---|---|---|---|
| 1 - 20 | 73.59 | 3.04 | 16.31 | 6.43 |
| 21 - 50 | 70.91 | 6.37 | 20.85 | 6.95 |
| 51 - 100 | 48.39 | 10.00 | 30.85 | 11.26 |
| 101 - 200 | 50.54 | 11.95 | 24.05 | 13.68 |
| 201 - 300 | 45.94 | 12.03 | 25.94 | 16.09 |
| 301 - 500 | 47.67 | 15.33 | 28.83 | 8.17 |
| 501 - 1000 | 33.25 | 22.75 | 25.50 | 18.00 |
| 1001 - 3000 | 50.58 | 9.58 | 34.42 | 5.42 |
| 3001 - | 50.00 | 17.50 | 32.50 | 0.00 |

Table 8. Lambing systems and the labour used (%)

| Flock size | Lambing | | | Labour | | |
|---|---|---|---|---|---|---|
| | Annual | Annual but devided | Frequent | Family only | F + Temporary | Employees only |
| 1 - 20 | 76.97 | 9.52 | 13.49 | 95.15 | 2.88 | 0.96 |
| 21 - 50 | 58.86 | 20.57 | 20.57 | 96.40 | 2.88 | 0.72 |
| 51 - 100 | 42.34 | 24.32 | 33.33 | 90.80 | 8.05 | 1.15 |
| 101 - 200 | 36.56 | 27.96 | 35.48 | 78.75 | 12.50 | 8.75 |
| 201 - 300 | 23.53 | 32.35 | 44.12 | 72.41 | 10.34 | 17.24 |
| 301 - 500 | 13.33 | 26.67 | 60.00 | 52.00 | 28.00 | 20.00 |
| 501 - 1000 | 10.53 | 26.32 | 63.16 | 66.67 | 5.56 | 27.78 |
| 1001 - 3000 | 8.33 | 33.33 | 58.34 | 16.67 | 8.33 | 75.00 |
| 3001 - | 0.00 | 50.00 | 50.00 | 0.00 | 0.00 | 100.00 |

Table 9. The origin of rams and their distribution (%)

| Flock size | Origin of rams | | | |
|---|---|---|---|---|
| | Nucleus flock | Own produced | Others | Altogether |
| 1 - 20 | 5.0 | 87.2 | 7.8 | 100.0 |
| 21 - 50 | 15.1 | 66.0 | 18.8 | 100.0 |
| 51 - 100 | 19.2 | 66.6 | 14.2 | 100.0 |
| 101 - 200 | 22.7 | 50.9 | 26.4 | 100.0 |
| 201 - 300 | 32.8 | 45.6 | 21.6 | 100.0 |
| 301 - 500 | 45.6 | 28.5 | 25.9 | 100.0 |
| 501 - 1000 | 51.4 | 34.3 | 14.3 | 100.0 |
| 1001 - 3000 | 56.6 | 39.6 | 3.8 | 100.0 |
| 3001 - | 100.0 | 0.0 | 0.0 | 100.0 |

Table 10. The origine of feeds for sheep (%)

| Flock size | | Origine of feeds | | |
|---|---|---|---|---|
| | | Purchased only | Self produced only | Mixed |
| 1 - 20 | 1 | 34.11 | 58.14 | 7.75 |
| | 2 | 28.35 | 62.96 | 8.66 |
| 21 - 50 | 1 | 31.88 | 51.96 | 16.76 |
| | 2 | 28.65 | 57.30 | 14.04 |
| 51 - 100 | 1 | 25.66 | 60.18 | 14.16 |
| | 2 | 25.66 | 60.18 | 14.16 |
| 101 - 200 | 1 | 23.96 | 46.88 | 29.17 |
| | 2 | 22.92 | 51.04 | 26.04 |
| 201 - 300 | 1 | 26.47 | 64.71 | 8.82 |
| | 2 | 11.76 | 82.35 | 5.88 |
| 301 - 500 | 1 | 20.00 | 56.67 | 23.33 |
| | 2 | 23.33 | 63.33 | 13.33 |
| 501 - 1000 | 1 | 21.05 | 47.37 | 31.58 |
| | 2 | 10.53 | 57.89 | 31.58 |
| 1001 - 3000 | 1 | 0.00 | 58.33 | 41.67 |
| | 2 | 0.00 | 66.67 | 33.33 |
| 3001 - | 1 | 0.00 | 100.00 | 0.00 |
| | 2 | 0.00 | 100.00 | 0.00 |

1 Concentrates (seeds and pellets)
2 Forages (hay, silage)

Table 11. Distribution of membership in different organizations (%)

| Flock size | Membership in % of total No. of flocks | In Association | Council | Societies |
|---|---|---|---|---|
| 1 - 20 | 61.34 | 20.17 | 42.02 | 7.56 |
| 21 - 50 | 72.84 | 10.49 | 49.38 | 19.14 |
| 51 - 100 | 61.17 | 13.59 | 38.83 | 15.53 |
| 101 - 200 | 65.85 | 20.73 | 41.46 | 17.07 |
| 201 - 300 | 63.64 | 27.27 | 9.09 | 30.30 |
| 301 - 500 | 53.57 | 7.14 | 21.43 | 28.57 |
| 501 - 1000 | 57.89 | 21.05 | 36.84 | 15.79 |
| 1001 - 3000 | 72.73 | 18.18 | 63.64 | 9.09 |
| 3001 - | 100.00 | 100.00 | 100.00 | 50.00 |