DESIGNING STUDY FOR A FAMILY FARM WITH 600 GOATS

STUDIU DE PROIECTARE PENTRU O FERMĂ FAMILIALĂ CU UN EFECTIV DE 600 CAPRE MATCĂ

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In the hilly and plains area of Banat region, goat rearing for milk production has chances to become a profitable business. After Romania integration into the EU market there will be no quotas for goat milk and meat production. Also, important low-production arable land areas (over 3 million hectares) will be laying fallow in the next years, spectacularly increasing the fodder area for ruminants. There a few goat family farms having an efficient technological flow and with possibilities to process the milk in Romania. In this paper the bases are laid down for projecting a farm with 600 indigenous goats, to be exploited in an intensive system and genetically improved with Sannen or French Alpine he-goats. The following reproduction indices were planned for the 600 goats: goats in estrus per season 96%, fecundity 95%, goats that keep the pregnancy 98%, kidding goats 90%, prolificacy 170%, and birth rate 152 kids for 100 dam goats. The total population after weaning the kids is 600 goats, 24 he-goats, and 173 reproduction female kids. For feeding this population 66.8 ha are required out of which 43.1 ha with grasses pasture, 2.1 ha alfalfa, 10.2 ha corn, 4.2 ha barley, and 6.6 ha oats. Goats are housed in 4 shelters, in 12 group pens of 48 heads. Goats will be fed year-round with grass haylage, oats straw and concentrate mixtures. This farm will produce 2250 Hl milk per year (mechanical milking), 150 reproduction female kids for selling at 8-9 months of age, 500 fattening kids, and 120 culled goats sold for meat. The annually estimated gross income will be 34000 EUR.

Key words: goat, goat farm project

Introduction

Goats possess excellent qualities for adaptation as well as maternal qualities (very good mothers, high prolificacy, and exceptionally high biological value milk). Also, goats are very easy to be reared.

All these advantages determined the farmers from the Western European countries to move from a simple and traditional exploitation performed by the goat
breeders for fulfilling their family’s needs to the industrial rearing in specialized farms that allowed obtaining hygienic low cost milk.

Goats rearing have the highest chance to successfully integrate into the European Union of all the Romanian Agriculture sectors, because there is a high deficit of both goat milk products and kid meat.

Also, after Romanian integration into the EU market there will be no quotas for these two products.

The aim of the paper was to elaborate a projection study for a modern farm with 600 goats, based on some observations and researches.

**Materials and Methods**

The modern concept regarding the goats’ exploitation was envisaged in conceiving this projection. This has the following principles:

- higher comfort for goats;
- mechanization of the main operations: feeding, watering, milking, manure removal;
- low labor usage;
- high milk production having superior hygienic qualities;
- high economic efficiency.

At the beginning, the population will be composed of the Banat White (60%) and Carpathian breeds (40%) which will be genetically improved by using he-goats from the Sannen breed.

For fodder production a cultivated pasture will be planted, made up of grasses only in order to be able apply herbicides in the first year.

For ration formulation the IBNA Bucharest New Guide for Ration Formulation in Sheep and Goats, edition 2002 was used.

Goats in lactation were fed only grasses haylage, cereals and barley straw.

A dietary flushing based on replacement of 50% of the grass haylage with withered alfalfa (2.5-3 kg) was applied to reproduction goats in order to prepare them for mating.

During the first 3-4 years of exploitation the pen mating system will be applied, using one he-goat for 48 goats, for 40 days. After this period of time the he-goat is replaced with another one for 20 days.

**Results and Discussions**

**Biological material**

For the beginning the biological material will be formed up of 350 Banat White goats (60%) and 226 Carpathian goats (40%). In spite that Banat White breed is more productive, purchasing goats only from this breed might be difficult because the population is small.

In the Western Romania there are only 1 to 2 goats per breeder.
This project forecasts the following goat population structure.

**Goat population structure**

<table>
<thead>
<tr>
<th>Structure for a module of 100 goats</th>
<th>Structure for 576 goats</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 dam goats</td>
<td>576</td>
</tr>
<tr>
<td>4 he-goats</td>
<td>24</td>
</tr>
<tr>
<td>30 reproduction female kids</td>
<td>173</td>
</tr>
<tr>
<td>2 reproduction male kids</td>
<td>12</td>
</tr>
<tr>
<td>Population after weaning and selling the fattened kids</td>
<td>136</td>
</tr>
<tr>
<td>Suckling kids (0 to 45 days of age)</td>
<td>152</td>
</tr>
</tbody>
</table>

**Note:**
- E% - goats in estrus 96% (0.96)
- Fm% - fecundity 95% (0.95)
- Pg% - pregnancy keeping 98% (0.98)
- Pf% / prolificacy 170% (1.7)
- IN% - birth rate
  \[
  \text{IN} = \text{IE} \times \text{Fm} \times \text{Pg} \times \text{Pf} = 0.96 \times 0.95 \times 0.98 \times 1.7 \times 100 = 152\%
  \]
- Dam goats 576 x 1.52% = 875 kids
- Total kids born 875, out of which 75 kids non-viable (8.57%) = 800 (400 female and 400 male)

After purchasing the goats, during the first year a hybridization of the Carpathian breed will take place using artificial inseminations with semen from the Saanen breed he-goats.

**Building arrangement**

In order to assure the sanitary protection, a strict delimitation with fences is required, of at least two functionally distinctive areas: the administrative area and the production area.

The **administrative area** is made of the following: equipment barn, disinfection devices for vehicles and people, offices, sanitary strainer, and resting room for personnel. (Figure 1)

The **production area** comprise: goat shelters, hay shelter, concentrates barn, manure platform etc., and is fenced in with a 1.7-1.8 m tall fence.

The production area has a single entrance with a gate and disinfection device for the vehicles that provide the materials required for production process, and a gate and disinfection device for the people.

The animal receiving and delivery ramp is placed at the edge of the production area, having the access gate in the fence of the production area. This gate is continued with the unloading ramp. This way the transportation vehicles have no access into the production area. Buildings are designed in such a way that they will function as shelter-type confinement buildings during the hot season and closed buildings during the cold season.
Figure 1. **Farm for 600 goats (reproduction goats)**  
*site plan*  
scale 1: 1.000
The walls are built from bricks on three sides of the building. On the side from the feeding alley dismountable thermo-insulating panels will be placed, fixed on a resistance structure made of wooden posts and beams. Roof framework will be build of wooden rafters and purlins. The roof cover will be made of corrugated or pleated metal sheet having a thermo-insulation material.

A total of 144 goats will be housed in each of the 4 shelters that have 3 group pens (S = 14.85 x 5.50 = 81.68 m²; 1.70 m²/animal) placed on a single row. (Figure 2) The two 60.30 m long shelters have 2 group pens each for housing 160 reproduction female kids (S = 5.00 x 5.50 = 27.50 m²; 0.69 m²/animal) and one pen each for housing he-goats (S = 4.85 x 5.50 = 26.68 m²; 2.22 m²/animal). Transversal delimitation of the pens will be provided by the mobile wire net panels. (Figure 3) Animals will be kept on deep litter made of straw. The deep litter area will be 4.50 m wide. There will be a 1 m wide and 0.20 m high curb toward the feeding alley that allow goats to stand in an oblique position they prefer.

- feeding will be carried out by using a mixing wagon. The manger is made of concrete and is 0.5 m wide. Towards the pens the wall of the manger will be provided with a pipe grating or a locking system, in order to allow individual access of animals to feed. The 4.00 m wide feeding alley is placed between two shelters.

- bedding is evacuated by using a tractor equipped with a front loader, which will enter the buildings through the doors from the front walls. The pens’ floor is made of traffic concrete.

- the pens’ floor have a 2% slope towards surface drains in order to evacuate the purine and washing waters. From these drains the used water is directed through underground channels into external pits, from where the water s transported by tank wagons to the manure platform. The walls and the floor of the drainage pits are made of waterproof concrete.

- water for the animals is provided through constant level waterers (2 for each pen in goats, one for pen in female young stock and he-goats, in total 30 waterers). Also, taps for washing hoses will be provided.

- the shelter will have an electrical illumination system that should provide a minimum illumination level of 1.2 W/m² (6 bulbs of 60 W in the 48.30 m shelters and 8 bulbs of 60 W in the 60.30 m shelters).

- doors and windows are made of wood. The double glass-windows will have hinges in the bottom part. Windows will have an opening regulation device. The dimensions of windows will be 1.50 x 0.80 m and will be placed at 1.60 m high on the wall opposite to the manger. For each pen a 1.00 x 2.10 m door will be provided for animals’ access to the paddocks. These doors will have a 10 cm high threshold. For bedding removal the front walls will have 2.60 x 2.80 sliding doors.

- roofs will be provided with thermal insulation (glass wool – 5 cm thick)

- for a better comfort during the hot season the wall toward the feeding alley will be taken down
Figure 2. Shelter for goats
- horizontal section –
- scale 1:100 –

Figure 3. Shelter for goats
- transversal section –
- scale 1:50 –
- during the cold season the ventilation will be carried out like this: the fresh air will have access through the window, and the bad air will be evacuate through the 3 cm-high slit made between the beam above the wooden posts and the roof boarding.

Goats are milked with a 2x12 milking equipment. After the kids are weaned (at 45 days of age) about 450 liters of milk per goat is milked that is 2250 hl milk per year.

The total expenses are estimated at 8500 EUR, out of which 57800 EUR for feeds (68%).

The total annual estimated incomes are 118500 EUR, out of which the milk represents 58%. The incomes are made up of selling 2250 hl milk, 150 reproduction female kids, 500 fattened male kids and 120 culled goats.

Conclusions

The structure of the animal population is 600 dam goats, 24 he-goats, and 173 reproduction female kids.

The kidding percentage of the goats is estimated at 90% (520 goats) with a prolificacy of 1.7 kids per goat.

The fodder crop area required is 66.8 ha, out of which 65.1% with grasses, 3.2% alfalfa, and 31.7% cereals.

The labor productivity is 27000 EUR per worker.

For operations’ mechanization the value of the equipment and machineries is 80000 EUR.

The estimated gross profit is 34000 EUR

Bibliography


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În zonele colinare și de șes ale Banatului creșterea caprelor pentru lapte are șanse să devină o afacere foarte profitabilă. După aderarea României la piața U.E. nu s-au impus cote limitative pentru producția de lapte și carne, provenite de la capre. Totodată importante suprafețe de teren arabil (peste 3 milioane ha), mai puțin productiv, vor fi înțeleșite în următorii ani, mărgind astfel spectaculos suprafața de bază furajeră pentru rumeagătoare. În România sunt puține ferme familiale de ovine cu flux tehnologic eficient și cu posibilități de procesare a laptelelor. În lucrarea de față s-au pus bazele pentru un proiect de fermă cu 600 capre indigene care să fie exploatate intensiv și ameliorate cu ţapi din rasele Sannen sau Alpină Franceză. Pentru cele 600 capre sunt prevăzute următoarele indici de reproducție: capră în estrus pe sezon 96 %, fecunditatea 95 %, capră care păstrează gestația 98 %, capră care fătează 90 %, prolificitatea 170 % și natalitatea 152 iei la 100 capre matcă. Efectivul total după înțărcarea iezilor este de 600 capre, 24 ţapi și 173 iesi. Pentru furajarea acestui efectiv sunt necesare 66,8 ha din care: 43,1 ha cultivate cu pajiște de graminee, 2,1 ha lucernă, 10,2 ha porumb, 4,2 ha orz și 6,6 ha cu ovază. Întreținerea caprelor se va face numai în stabulație, în 4 adăposturi prevăzute cu 12 boxe, unde sunt cazate 48 capre. Acestea vor fi furajate tot timpul anului cu semință de graminee, paie de ovază și amestecuri de concentrate. Această fermă este prevăzută să producă 2250 Hl laptele an (mulc mecanic), 150 iesi de reproducție care se vând la vârstă de 8-9 luni, 500 iei la îngrășat și 120 capre reformă destinate pentru carne. Anual fermă va realiza un venit net brut estimat la 34000 €.

Cuvinte cheie: capră, proiect fermă capre.

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