

Types of milking machines - parlours for dairy sheep and goats in Greece

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Types of milking machines

In Greece, the types of milking machines which are used for dairy sheep and goats are classified in four groups:

- Milking machines with bucket system**
- Barrow type milking machines (Trolley mobile milking machines)**
- Milking machines with pipeline in milking parlours**
- Mobile milking machines**

a. Milking machines with bucket system

Even today a large number of sheep and goats farms are using bucket milking machines system.

The size of the farms which are using the above system is not exceeding 100-150 animals in milk (small family-type farms).

This type of milking machines have low investment cost and are very simple in terms of organization.

The milking machines with buckets consist of :

- the vacuum pump
- the trap to protect the pump
- the vacuum regulator
- the vacuum pipeline
- the bucket

- There is a vacuum valve for every 2-4 animals.
- The minimum capacity of the bucket is usually 25 l.



Figure 1. Bucket milking machine system



Figure 2. Bucket system milking parlour

Variations of milking machines with buckets:

- 1.Sliding buckets which are moving on rails.**
- 2.Buckets with ramp.**
- 3.Milking machines on rails installed on the roof of the shed.**
- 4.Milking machines on rails with the use of ramp.**

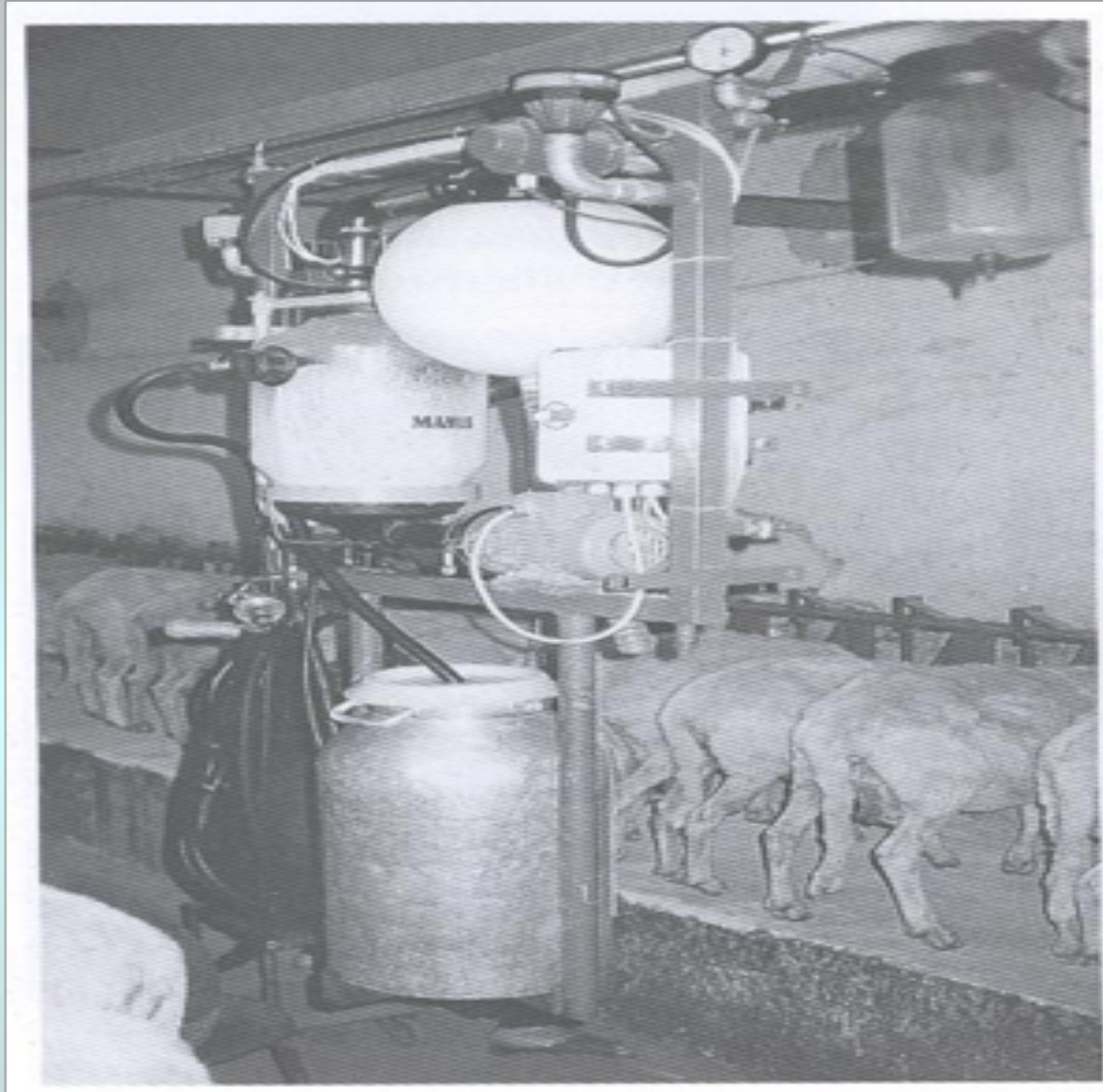
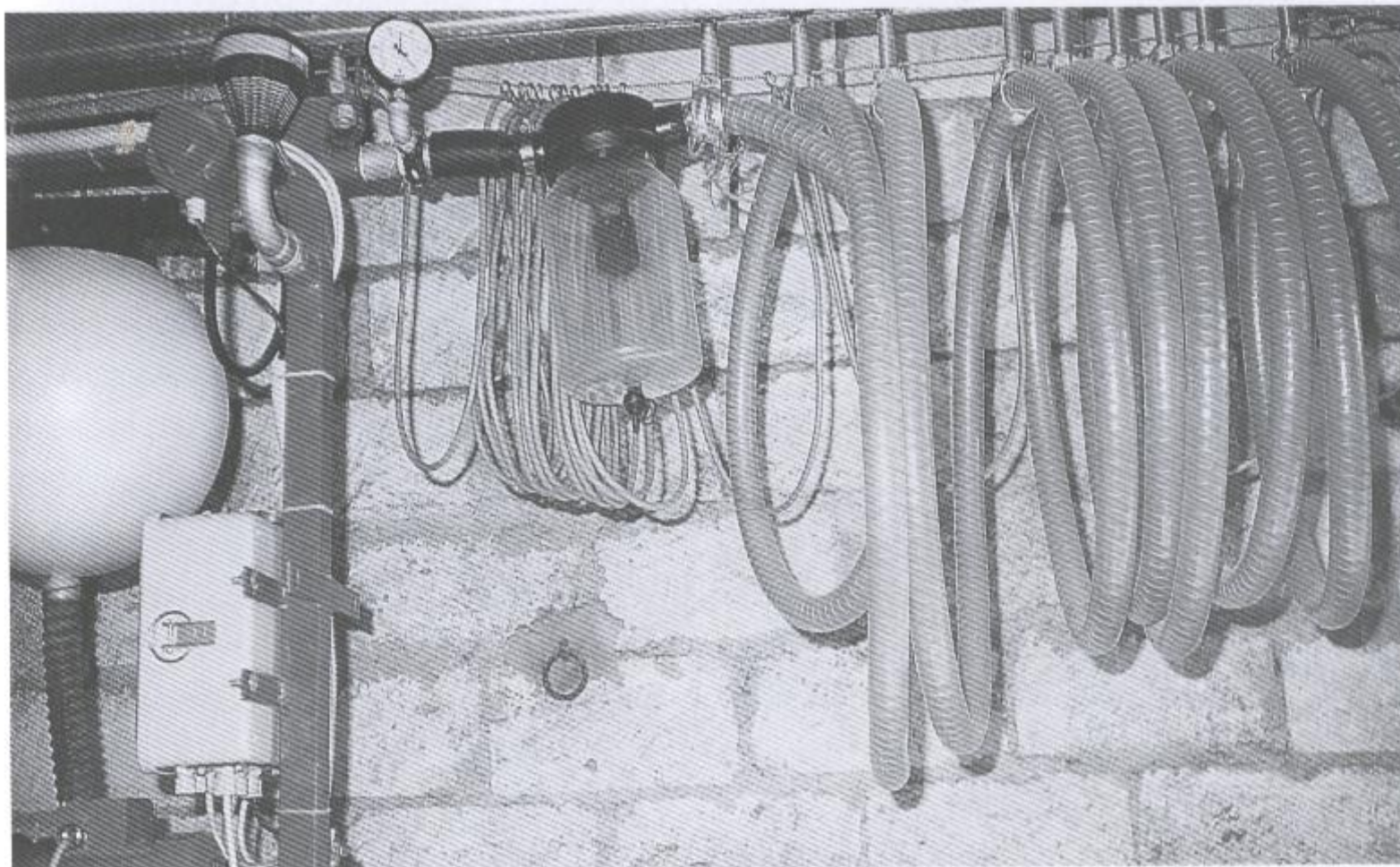


Figure 3. Mobile milking machine on roof rails



***Figure 4. Bucket milking machine on roof rails.
The spiral pipe is the main vacuum pipe.***

b. Barrow type milking machine

In this type of milking machine all the equipment are placed on frame with 2 or 4 wheels and there is no vacuum pipe.

For the extensive and semi-extensive farming systems this type is more suitable because is not necessary to install fixed equipment.



Figure 5. *Barrow type milking machines*

Throughput of milking machines per hour and milker

The throughput of the barrow type milking machine is about 110 ewes/milker or 80 goats/milker.

There is better performance in comparison with the normal buckets milking machines.

c. Milking machines with pipeline in milking parlours

This type of milking machines contains different types according to:

- the position of the animal in relation with the milker's position and/or**
- the method of entrance and exit of the animals.**

Classification of milking machines with milk pipeline

The various types could be classified into two groups:

- a. the fixed “Casse”, tunnel and herringbone,**
- b. the dynamic system of continuous movement (linear or rotary movement).**

c.a. Milking machines of fixed «Casse» type parlours

Today in Greece the majority of the milking machines are of the fixed “Casse” type parlours.

These milking parlours have one pit and one or two ramps.

The animals are headlocked on a vertical position against the axis of the pit.



Figure 6. “Casse” type milking parlour with low line



Figure 7. “Casse” type milking parlour with high line

Milking machines of fixed «Casse» type parlours (b)

The total number of stalls (milking places) is varying between 6 and 66.

These stalls can be:

- from the one side of the pit (one ramp) (1x6 to 1x32)
- from both sides of the pit (two ramps) (2x6 to 2x32).

The ratio of the milking units to the milking stalls could be 1:1, 1:2, 1:3 or 1:4.

The most frequent ratio is 1:2.

Variations of “Casse” type

- 1. “Casse” type milking parlour without pit**
- 2. Herringbone type milking parlours**
- 3. Tunnel type milking parlours**
- 4. Fast exit milking parlours**

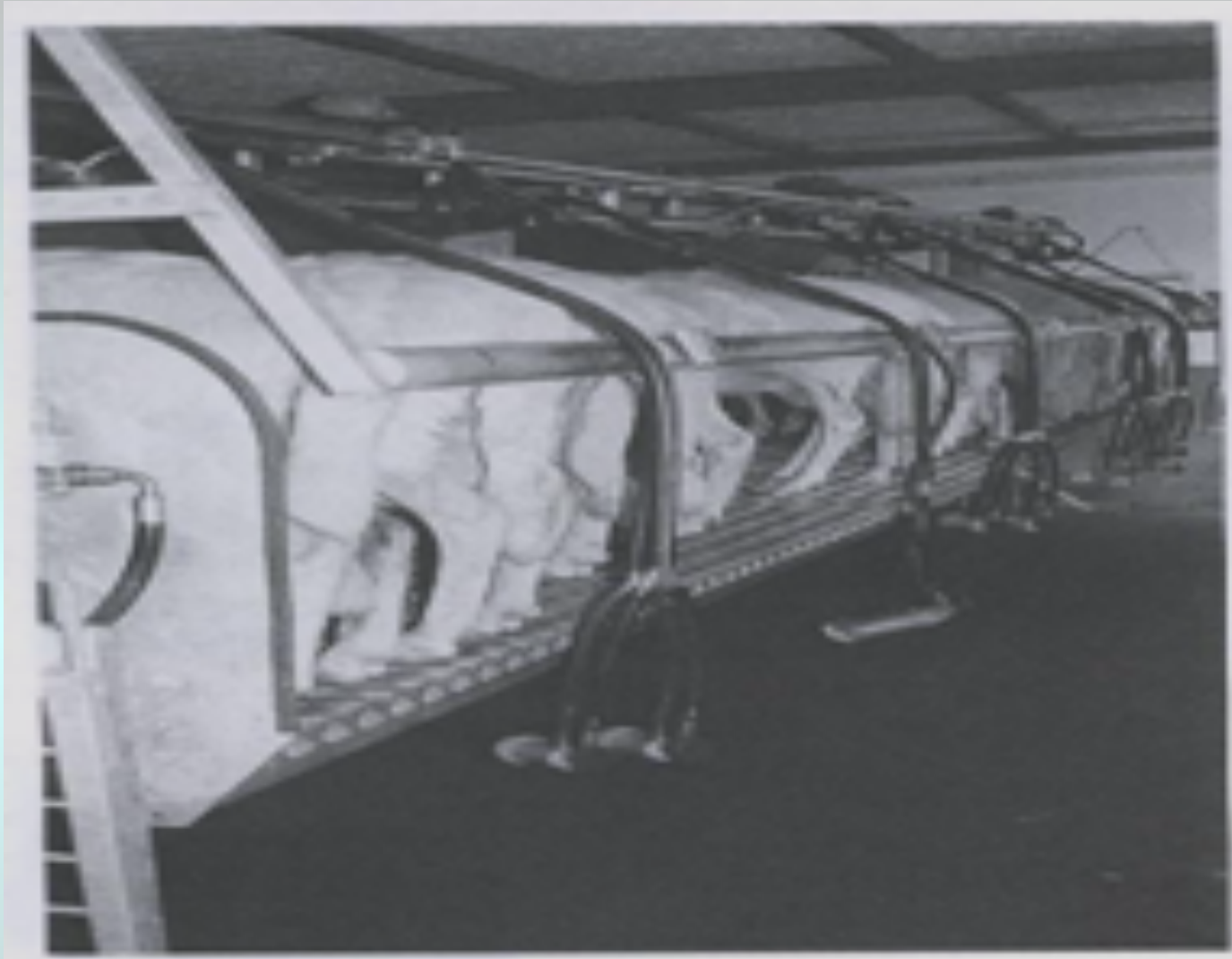


Figure 8. *Milking machine with hydraulic lift of the milking places*

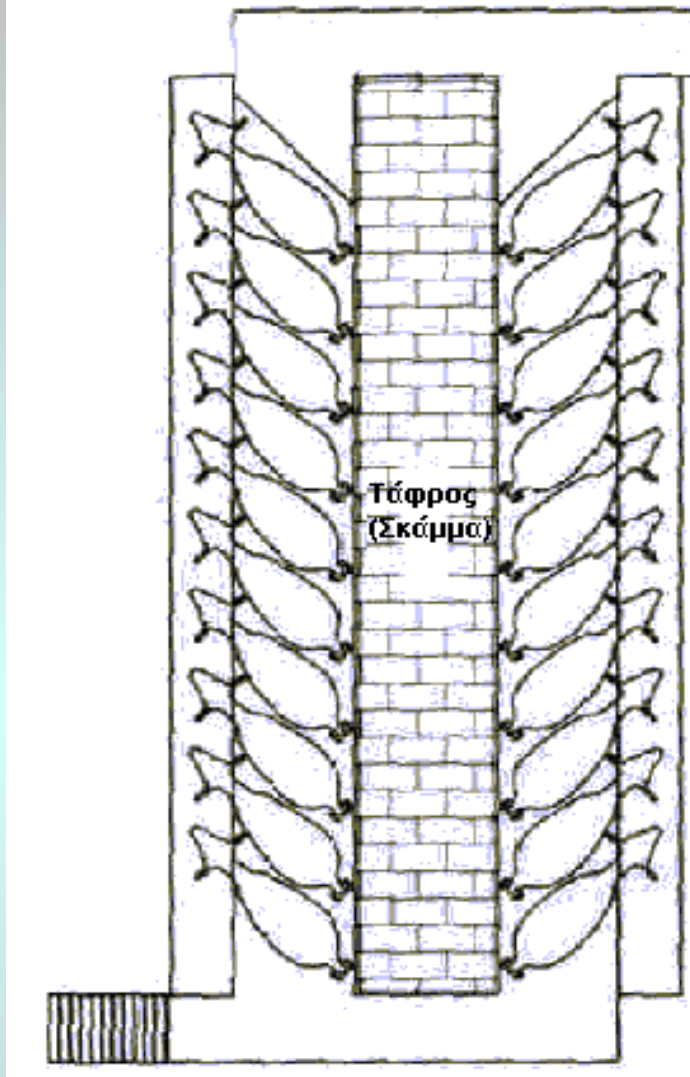


Figure 9. «Herringbone» type milking parlours for goat milking

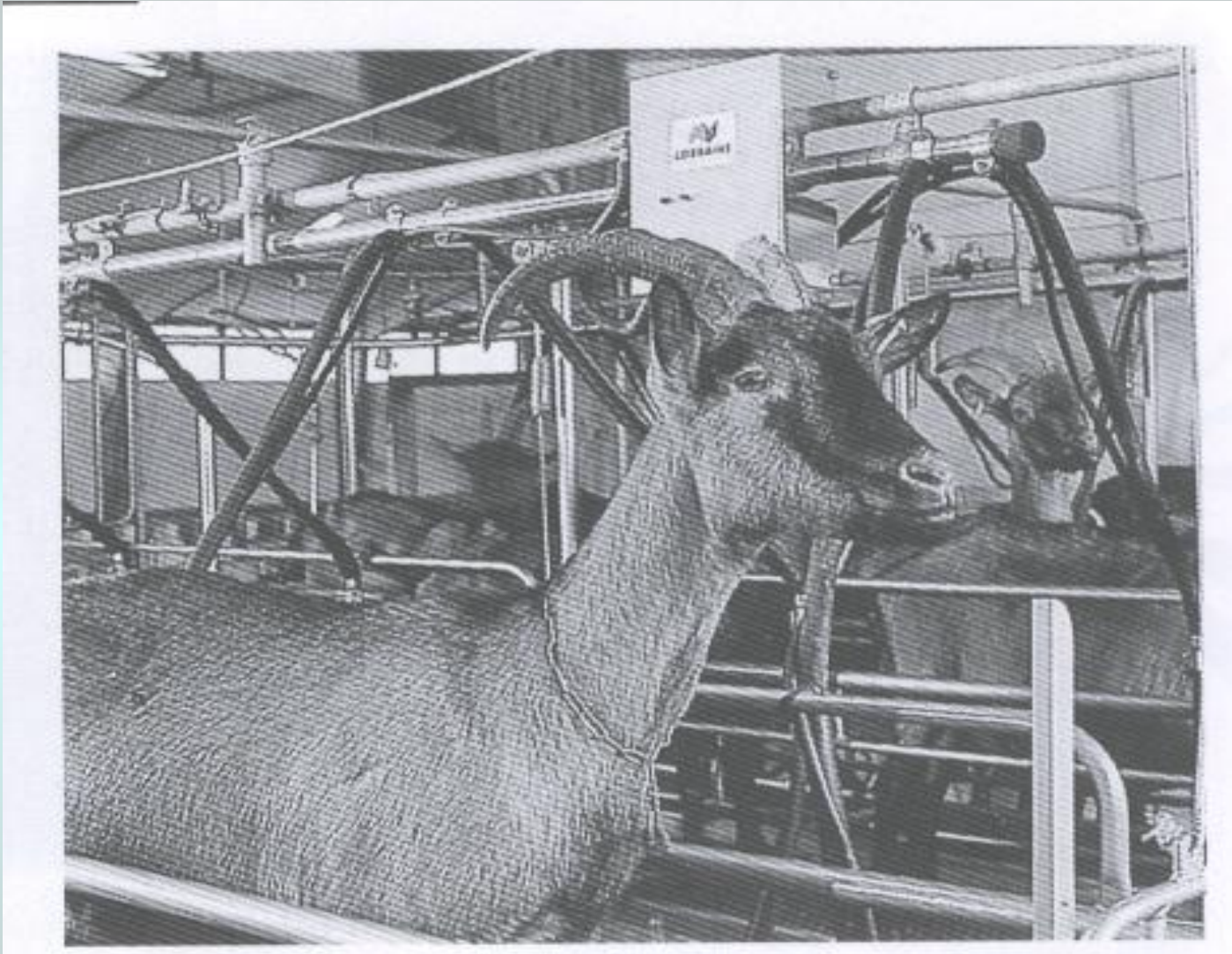


Figure 10. *Tunnel type milking parlours*

c.a.4. Fast exit milking parlours

Another variation of the “Casse” type milking parlour is the “fast exit” milking parlour.

- The release of the animals from traps is done very fast using two (2) pneumatic pistons on each ramp which are lifting the entrapment and feeding system and the animals are free in 2-3 sec.**
- The fast exit systems are characterized by better hourly performance (up to 20%) compared to traditional milking systems. The entrapment of sheep and goats is easier and the milking starts while the last animals of the group are getting entrapped.**



Figure 11. *The hydraulic lifting system of entrapment in milking machines of the fast exit type with automatic feeders*²³



Figure 12. *Exit of group of ewes from the fast exit system*



Figure 13. *The entrapment system is lowering after the exit of the group of animals*



Figure 14. *Milking parlor of “Fast exit” type (1x24) with automatic feeding system.*

c.b. Rotary (Carrousel) milking machines

The animals and milking units are moving in a circular way on a rotating platform.

The main characteristic of this milking system is the minimization of the input-output time from the headlock system.

The animals are placed in their milking position continuously in a form of a “continuous flow”.

Mechanics and technology of this type of milking machines is more complex.

Maintenance and installation costs are higher.

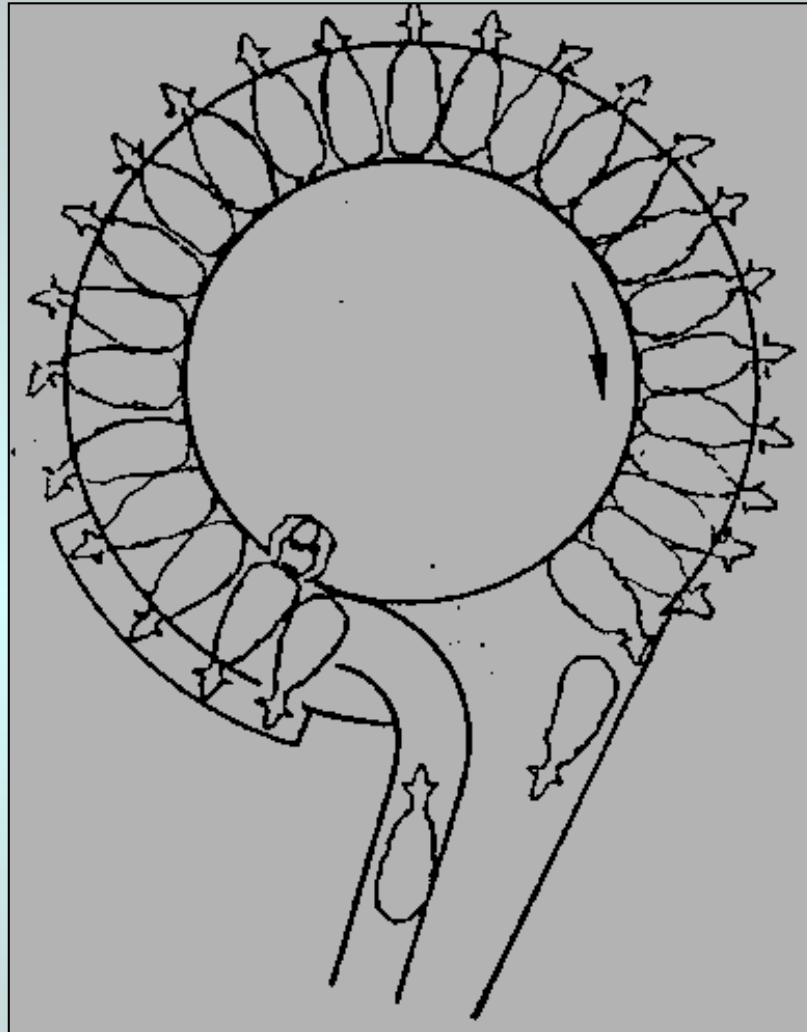


Figure 15. *Rotary (Carrousel) milking machines*

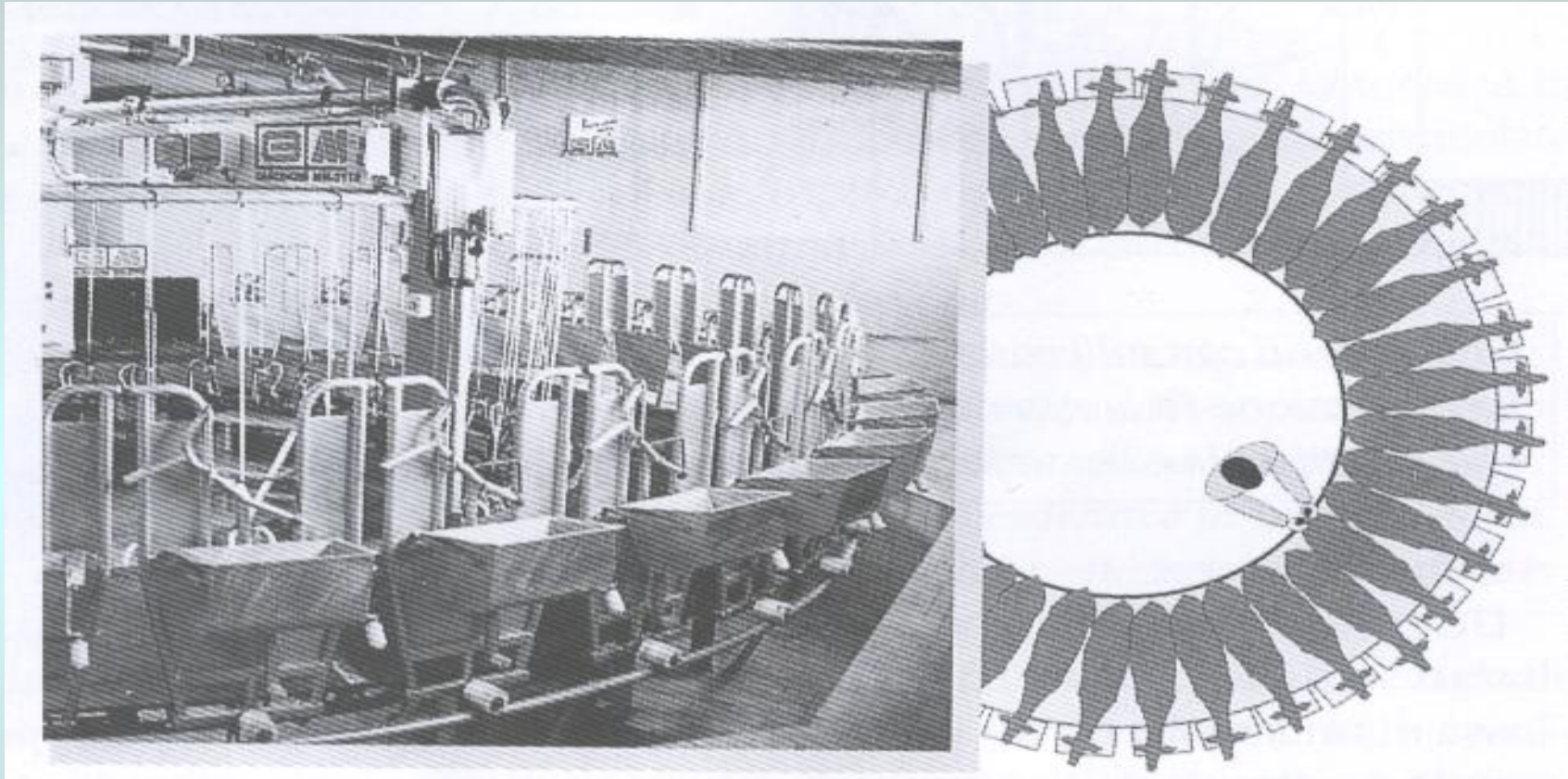


Figure 16. *Rotary milking machine of axial type with 24 milking places*

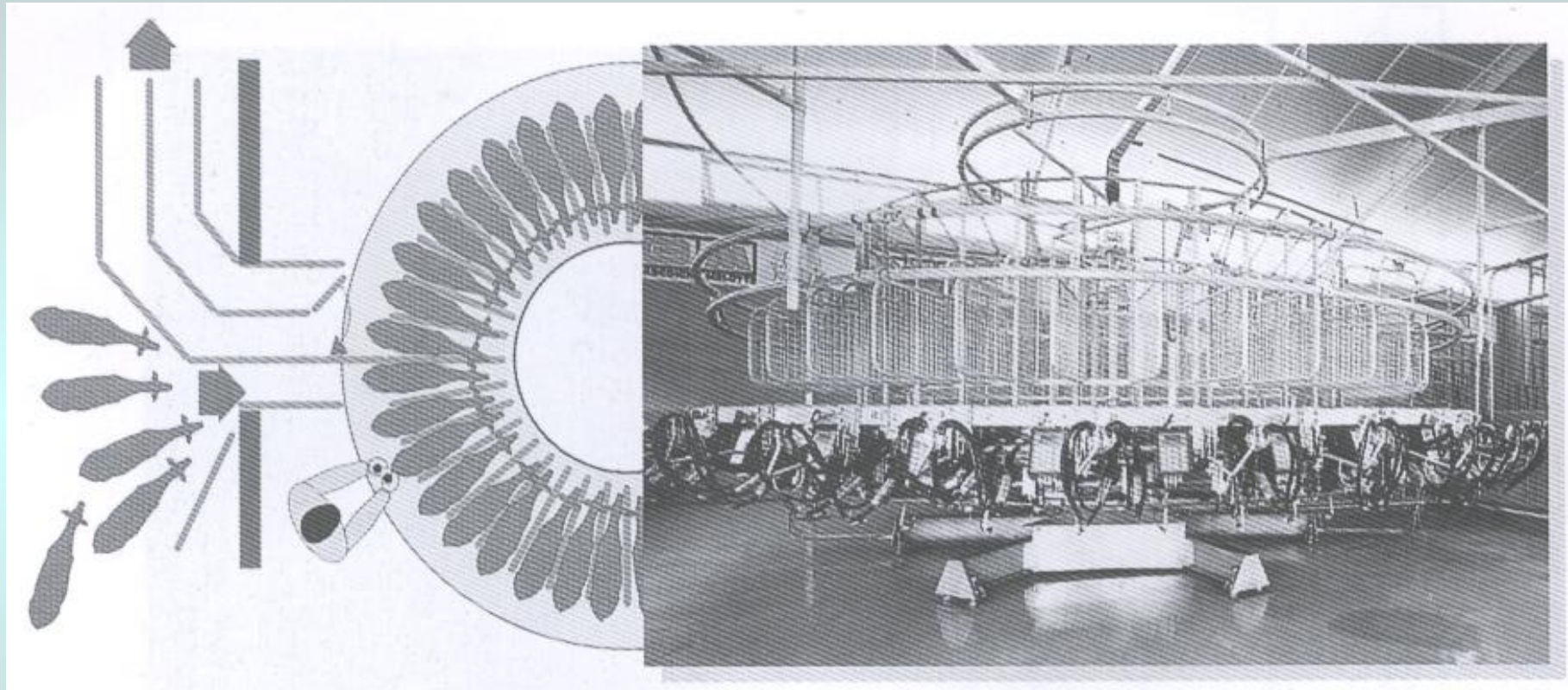


Figure 17. *Rotary milking machine of radial type with 24 milking places*

The rotary parlours (b)

Are used in farms with large number of animals in milk

Needs more :

a) maintenance and

b) attention from the farmer than the fixed “Casse” type milking parlour

The rotary parlours are available in the market in various capacities, from 6 to 72 milking positions (stalls)



Figure 18. *Rotary type milking parlour*

Variation of the Rotary parlour

1. Herringbone type milking parlour

This type of milking parlour can be used for milking goats.

Goats lined up in tangential direction on the platform (Herringbone position).

The entrance of animals is regulated by an automatic grid which opens over each position in front of the entrance corridor of the animals

The advantage of this type is that this construction is more simple, because there is no trapping system of the animals and the lifting system part of this equipment is installed on a platform.

2. Movable milking basis (linear movement)

In the market there are milking systems for sheep and goats where the ramp on which the animals are milked is moving on rollers.

In this case the movement is linear

The trapping and feeding systems are fixed with the milking base

This system which is identified as “potentially” intermediate between fixed “Casse” and rotary milking machines

In the milking machines with mobile base the hourly throughput increased by 15-20% compared to machines with fixed base.

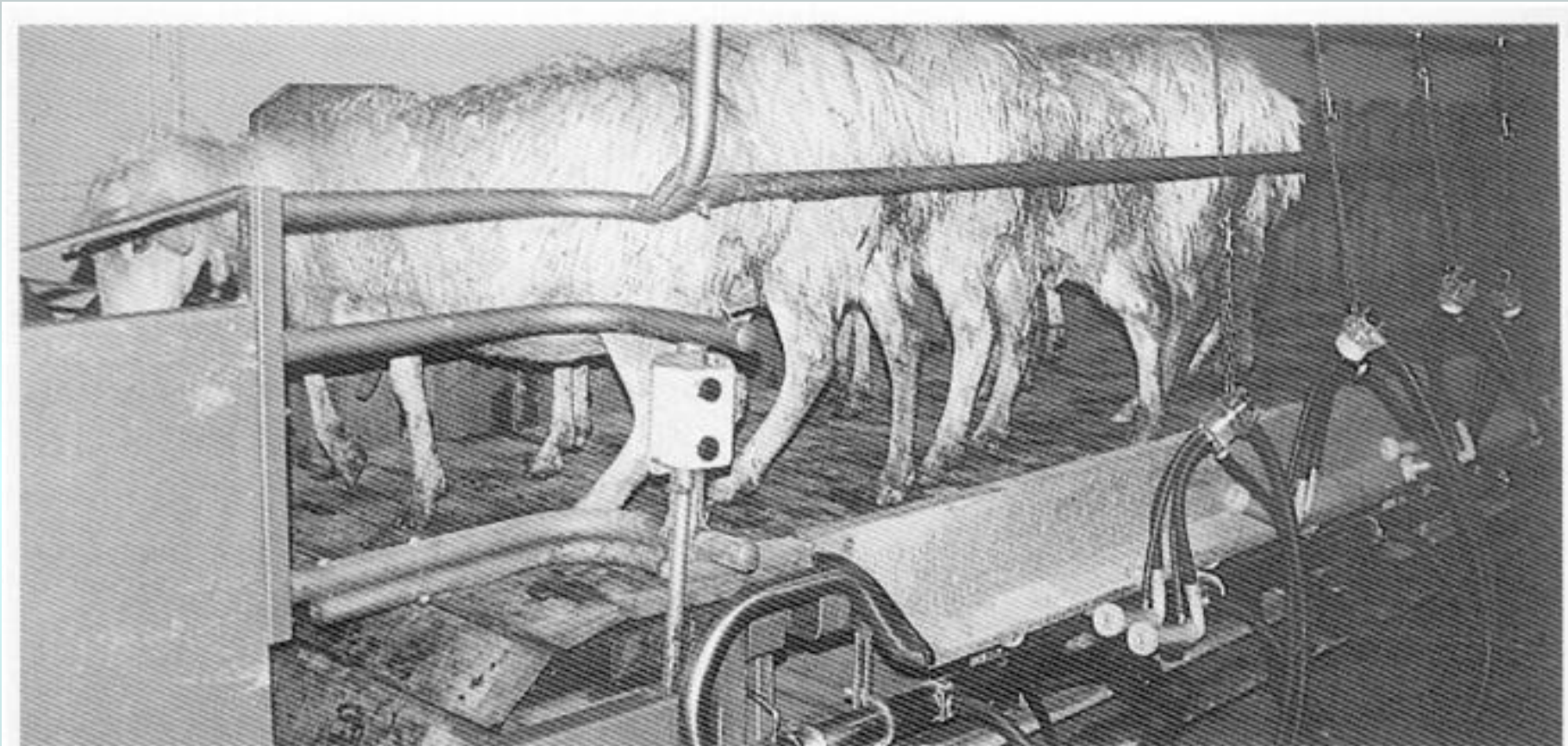


Figure 19. *Milking machine with linear movement*

d. The mobile milking parlours

Are used in Greece in a very small percentage of farms and only in cases where flocks of the same farm are in different areas or in extensive nomadic or semi-nomadic flocks.

All the equipment of the milking system is on a 4 wheel platform.

Functionally this milking system is similar with that of the “Casse” milking system and usually has 1x12, 2x12 or 2x24 milking positions.

The throughput of such milking system can reach 100-120 ewes or 60-80 goats per hour and milker.



Figure 20. *Trailer-type milking machine*

SPREADING OF MACHINE MILKING FOR SMALL RUMINANTS

- **1930 first application in the area of Roquefort in France**
- **in the 60's starts its actual spreading in France**
- **1980 in Greece the first installation took place in the farm of the Aristotle University of Thessaloniki**
- **1984 application in Greek farms**

TABLE 1. Farms and milking machines of sheep and goats per geographical region in Greece.

Geographical Region (Prefecture)	Number of Farms	Number of milking machines	Farms with milking machines (%)	Comments
ATTICA	960	55	5.6	~ 95% East Attica
EPIROS	15,766	232	1.5	~ 50% Ioannina
THRACE	4,855	155	3.2	> 60% Evros
THESSALY	14,260	555	3.9	~ 60% Larissa
CRETE	12,011	1,000	8.3	~ 50% Rethymno
MACEDONIA	16,206	895	5.52	~ 75% Central
LESVOS	3,977	110	2.8	
PELOPONNISOS	20,084	400	2.0	~ 37% Achaia & Ilia
MAINLAND OF GREECE & EVIA	28,169	275	0.98	~ 54% Phiotida
TOTAL	116,288	3,677	3.16	

TABLE 2. Farms and milking machines of sheep and goats in Grete.

Geographical Region (Prefecture)	Number of Farms	Number of milking machines	Farms with milking machines (%)
CRETE	12,011	1,000	8.3
Rethymno	4,211	500	11.87
Lasithi	1,124	80	7.12
Chania	3,400	150	4.41
Iraklio	3,276	270	8.24

The farmers when are purchasing/replacing a milking machine should take into account :

- the size and structure of the farm**
- the availability of milking labor**
- the organizing of farm work**
- the technical and functional traits of milking systems**
- the market value of each type**
- the capital depreciation**

A photograph of several white horses in a stable. The horses are standing in a row, facing away from the camera. The stable has wooden walls and a metal railing. The text "Thank you" is overlaid in a yellow, cursive font in the center of the image.

Thank you