

## NEW STRATEGIES OF ORGANIZING THE TECHNOLOGIC FLOW WITHIN THE SHEEP AND GOATS' FARMS

### NOI STRATEGII DE ORGANIZARE A FLUXULUI TEHNOLOGIC ÎN FERMELE DE OVINE ȘI CAPRINE

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*With the purpose of increasing the total milk production and milked production, the superposition of sheep and goats' milking over the servicing period and over the first two months of gestation. This fact influenced the milk sheep population – Palas an increase of the total average of milk with 14.58%, confronted by the sheep weaned before the servicing and by a milked production greater with 4.61%. The total average of milk production of sheep belonging to Palas Merino breed was 18.8% greater to the sheep within the gestation period and which were milked than the production of the sheep which were weaned before the servicing period, the average production of milked milk being 48.53%. The total average of milk production of the goats belonging to Carpatina breed was 30.4% and 24.0 % greater to the goats within the gestation period and which were milked confronted by the production of the weaned goats before the servicing period and the average production of milked milk was 58.7% and 51.6% greater. In order to increase the milk production as merchandise the modification of suckling lambs and kids growing technology took place and also the early weaning of lambs and kids. The lambs belonging to Palas Merino breed were weaned at the average age of 44 days and having the weight of  $14.78 \pm 0.25$  kg males and  $14.34 \pm 0.27$  kg females; the lambs belonging to milk production Palas population were weaned at the average age of 38 days and having the weight of  $12.05 \pm 0.22$  kg males and  $11.16 \pm 0.51$  kg females ;the lambs belonging to Palas population were weaned at the average age of 42 days; the kids belonging to Carpatina breed were weaned at the age of 48 days .*

**Key words:** sheep, milked production, goats.

#### Introduction

For the increase of economic efficiency of sheep and goats farms the production development by the growing and exploiting technologies improvement are aimed at, as well as the replacing of the expensive technologies with cheap and simple ones which could ensure a high productivity.

## Material and Methods

Researches were performed at ICDCOC–Palas Constanța. The animals comprised in the works have been individually watched regarding own performances report, registering data regarding: productions' control; reproduction indices; lambs and kids' birth weight and the evolution of body weight for the entire growing period, the calculation of the increase in body weight; milk production control based on Nica-Dermengi method (control coefficient method).

The maintenance of sheep and goats was made within the stabulation period 150-160 days and 205-215 of pasturing.

## Results and Discussions

Taking into consideration the fact that one of the safest method of profitableness of sheep and goats farms is the increase of merchandise milk production, the improvement of sheep and goats breeding and exploitation for milk production by the prolonging of sheep and goats' lactation period, especially in the milking period, by superposition of sheep and goats milking over the servicing period and over the first two months of gestation, early weaning of lambs and kids at the age of 35-45 days.

During the pasturing period the sheep within the gestation period were ensured 2.08 kg SU, 1.87 UN, 230 g PBD, with a consumption of 0.89 UN/ kg SU and 110.5 g PBD/kg SU; within the stabulation period, for the pregnant sheep were ensured 2.96 kg SU, 2.37 UN and 213 g PBD, with a consumption of 0.80 UN/kg SU, and 71.95 g PBD/kg SU. For the sheep in the lactation period, in stabulation and pasturing period, the consumption of fodders presented in table 2. For the sheep in lactation and during stabulation a ration of 2.98 kg SU, 2.26 UN and 213 g PBD was ensured, amounting a consumption of 0.758 UN/ kg SU and 71.47 g PBD/kg SU, and during the pasturing time the ration was that of 2.18 kg SU, 1.95 UN and 242 g PBD, with a consumption of 0.89 UN/kg SU and 111.01 g PBD/kg.

The superposition of sheep milking period over the servicing period and the first two months of gestation were performed in two lots, one comprising milk sheep belonging to Palas breed and the second lot comprising sheep from Merinos Palas breed (table 1). At the milk sheep belonging to Palas breed, at the experimental lot (76 heads) the total milk production was that of  $198.15 \pm 2.15$  litres, in a period of lactation of 232.5 days, achieving an average milk production of  $86.13 \pm 2.51$  litres. At the witness lot made up of the same population (130 sheep), which were weaned before the servicing period, an average milk production of  $172.94 \pm 7.62$  litres was achieved, in a lactation period of 178.14 days and also an average milking milk production of  $59.15 \pm 2.15$  litres. The total average milk production was greater with 14.58% to the pregnant sheep which were milked than to the milk production obtained from the sheep which were weaned before the servicing period. The period of lactation was 30.52% greater, the milk production being 45.61% greater.

**Table no. 1**

Milk production of the sheep to which the lactation was prolonged within the servicing period and within the first two months of gestation in comparison with the one obtained from the sheep weaned before the servicing period

Breed or population	Lot (n)	Total average production (litres)		Lactation period (days)	Milked milk production (litres)	
		$\bar{X} \pm s_x$	V%		$\bar{X} \pm s_x$	V%
Palas milk population	Experimental (76)	198.15±2.15	9.45	232.5	86.13 ±2.51	25.40
	Witness (130)	172.94±7.62	50.23	178.14	59.15 ±2.15	41.44
Merinos Palas breed	Experimental (30)	117.51±3.11	14.49	112.97	48.66±5.45	61.34
	Witness (60 heads)	98.91 ±4.15	32.50	93.25	32.76 ±3.18	75.18

The increase of the total milk production and of the lactation period did not have a negative influence on the reproduction process, the sheep from the milk population –Palas had estrus with a ratio of 95.05%, and the un-gelded (NR%), after the first servicing period were a ratio of 93.15%. It was registered a total milk production of 117.51±3.11 litres to the sheep belonging to Palas Merino (30 heads at the experimental lot) to which the milking period was prolonged over the servicing period and the first two months of gestation, in a period of lactation of 112.97 days and a milking production of 48.66 ± 5.45 litres. At the second lot formed by Merinos Palas breed (the witness lot of 60 heads), which was weaned before the servicing period, the total production was that of 98.91±4.15 litres, in a period of lactation of 93.25 days, obtaining an average production of merchandise milk of 32.76 ± 3.18 litres. The total average milk production of the sheep belonging to the Palas Merino breed was 18.8% greater to the pregnant sheep that were milked, in comparison with the milk production of the sheep belonging to the same breed which were weaned before the servicing period. The average merchandise milked milk production was 48.53% greater at the experimental lot than the average merchandise milked milk production from the witness lot. The increase of the total milk production by the prolongation of the lactation period over the servicing period and the first two months of gestation to the Merinos Palas breed did not have a negative influence on the reproduction process, the sheep entered into the estrus period with a ratio of 97.5%, and the un-gelded (NR%), after the first servicing period were a ratio of 92.5%.

For the goats' lot to which the milking process was prolonged within the servicing period and the first two months of gestation the milk production achieved can be seen within table no. 2.

At the goats belonging to Carpatina breed from ICDCOC Palas to which the prolonging of milking process was performed over the servicing period and the first two months of gestation a total milk production of 299.35±1.15 litres was obtained, in a period of lactation of 289 days and a milked milk production of 179.17±2.51 litres

**Table no. 2**

The milk production of the goats to which the lactation was prolonged within the servicing period and the first two months of gestation in comparison with the one obtained from the goats weaned before the servicing period

Experience place	Lot (n)	Total average production (litres)		Lactation period (days)	Milked milk production (litres)	
		$\bar{X} \pm s_x$	V%		$\bar{X} \pm s_x$	V%
ICDOC - Palas	Experimental (35)	299.35±1.15	2.27	289	179.17±2.51	8.28
	Witness (37)	229.47±2.15	5.69	209	112.85±2.11	11.37
Private breeder	Experimental (60)	283.86±2.02	5.51	282	162.78±2.17	10.33
	Witness (60)	228.87±2.18	7.37	202	107.35±1.99	14.35

At the second lot of goats formed by the same breed (the witness lot of 37 heads), which was weaned before the servicing period, the total production was that of 229.47±2.15 litres, in a period of lactation of 209 days, obtaining an average production of merchandise milk of 112.85±2.11 litres. The total average milk production of the goats belonging to Carpatina breed was 30.4% greater to the pregnant goats which were weaned, in comparison with the milk production of the same breed which were weaned before the servicing period. The average production of milked milk was 58.7% greater to the experimental lot than the average merchandise milk production of the witness lot.

For the Carpatina breed goats belonging to the private breeder (60 heads of the experimental lot) to which the milking process was prolonged over the period of servicing and the first two months of gestation a total milk production of 283.86 ±2.02 litres was obtained, in a period of lactation of 282 days and a milked milk production of 107.35 ± 1.99 litres. At the second lot of goats (the witness lot of 60 heads), which were weaned before the servicing, the total production was that of 228.87±2.08 litres, in a period of lactation of 202 days, obtaining an average production of merchandise milk of 107.35 ± 1.99 litres.

The total average production of milk obtained from Carpatina breed goats from the breeder was 24.0 % greater to the pregnant goats which were milked, in comparison with the same breed's production, goats which were weaned before the servicing period. The average milked milk production was 51.6% greater on the experimental lot than the average production of merchandise milk from the witness lot.

In order to increase the merchandise milk production the suckling lambs and kids growth technology modification was performed, by practicing the early weaning. Therefore, the process of foddering of lambs and kids started, using a high quality hay (with vitamins and lucerne) and a mixture of concentrated fodders, beginning from 8-12 days of age, with the purpose of familiarizing them with these fodders, a faster developing of the digestive tube, so that the lambs and kids not to be affected by the weaning stress, not to get them sick or even provoke death. The early weaning of lambs, at the age of 38-44 days and weighing 10-13 kg and of

lambs at the age of 48 days and weighing 9-11 kg did not endanger the life and health of the lambs, their development has been normally done, as you can notice in the tables no. 3, 4 and 5.

**Table no. 3**

**Evolution of early weaned lambs body weight**

Breed or population	When did the weighing take place	Lambs weight					
		Males			Females		
		n	$\bar{X} \pm s_x$	V%	n	$\bar{X} \pm s_x$	V%
Merinos Palas	Birth weight (kg)	80	5.14±0.09	15.66	61	4.68 ± 0.09	15.02
	Weight at 28 days (kg)	80	12.45±0.23	16.52	61	11.88±0.25	16.43
	Weaning weight 44 days (kg)	80	14.78±0.25	15.13	61	14.34±0.27	14.70
Milk population Palas	Birth weight (kg)	55	4.62±0.26	41.74	60	4.25 ± 0.39	71.08
	Weight at 28 days (kg)	55	10.26±0.75	52.21	60	9.34±0.54	44.78
	Weaning weight 38 days (kg)	55	12.05±0.22	13.54	60	11.16±0.51	35.39
Prolific population Palas	Birth weight (kg)	44	4.67±0.12	17.04	63	4.35 ± 0.12	21.89
	Weight at 28 days (kg)	44	10.88±0.16	9.75	63	9.45 ± 0.24	20.15
	Weaning weight 42 days (kg)	44	13.28±0.71	35.46	63	11.97±0.35	23.21

Merinos Palas breed lambs had a birth weight of 5.14±0.09 kg males and 4.68 ±0.09 kg females. Watching closely the evolution of the lamb's body weight, these ones being at the age of 28 days, they reached the weight of 12.45±0.23 kg males and 11.88±0.25 kg females. The lambs weaning was performed at the average age of 44 days and the weight of 14.78±0.25 kg males and 14.34±0.27 kg females. The lambs belonging to the milk population of Palas had a birth weight of 4.62±0.26 kg males and 4.25±0.39 kg females, registering at the age of 28 days the weight of 10.26±0.75 kg males and 9.34±0.54 kg females. The lambs' weaning was performed at the age of 38 days with the weight of 12.05±0.22 kg males and 11.16±0.51 kg females. The evolution of body weight of the Palas population lambs, which were early weaned at the average age of 42 days, was the following: at birth the males had the weight of 4.67±0.12 kg, and the females of 4.35±0.12 kg, at the age of 28 days the males had the weight of 10.88±0.16 kg, and the females of 9.45±0.24 kg, and at the moment of weaning the males had 13.28±0.71 kg and the females had 11.97±0.35 kg. The daily average increase in weight was calculated (table no. 3) by periods, 1day-28 days, 28 days-the age of weaning and for the entire period from the birth till the weaning time, by sexes, in order to watch the lambs body weight and if it is possible to perform their early weaning. The increases achieved by the lambs from all the experimental lots, belonging to all the sheep breeds, prove the possibility of performing this modification of technological flow. The Merinos Palas lambs, during 1day-28 days obtained the daily average increase with the greatest value of 261.1 ± 5 g for males and 257.1±7g for females. The lambs belonging to the Palas milk population, within the same period, obtained a less daily average increase of 201.4±5 g for males and 181.8±5 g for females, the lambs belonging to the prolific population Palas obtained a daily average increase

of  $221.8 \pm 7$  g for males and  $183.2 \pm 5$  g for females. During the 28 days of weaning, the daily average increases had smaller values, the intensity of lambs growing is decreasing and the lambs begin to consume more and more vegetable fodders. Merinos Palas breed lambs had the daily average increase of  $145.6 \pm 14$  g for males and  $153.8 \pm 12$  g for females, the lambs belonging to milk population Palas, within the same period obtained a greater daily average increase of  $179.0 \pm 12$  g for males and  $182.0 \pm 14$  g for females, from the lambs belonging to the prolific population Palas obtained a daily average increase of  $171.42 \pm 14$  g for males and  $166.4 \pm 11$  g for females. During the period of 1 day of weaning, the daily average increases had the greatest value of the lambs belonging to Merinos, where the daily average increase was that of  $219.1 \pm 12$  g for males and  $219.5 \pm 11$  g for females, from the lambs belonging Palas milk population it was obtained a daily average increase of  $195.5 \pm 16$  g for males and  $181.8 \pm 15$  g for females, from the lambs belonging to the prolific population obtained a daily average increase of  $205.0 \pm 13$  g males and  $181.4 \pm 12$  g females.

**Table no. 4**

Daily average increase of early weaned lambs

Breed and population	Period for which the daily average increase was calculated	Daily average increase					
		Males			Females		
		n	$\bar{X} \pm s_x$	V%	n	$\bar{X} \pm s_x$	V%
Merinos Palas	Daily average increase within the period of 1-28 days (g)	80	$261.1 \pm 5$	17.13	61	$257.1 \pm 7$	21.26
	Daily average increase within the period 28 days- weaning (g)	80	$145.6 \pm 14$	86.01	61	$153.8 \pm 12$	60.93
	Daily average increase within the period 1 day- weaning (g)	80	$219.1 \pm 12$	48.98	61	$219.5 \pm 11$	39.14
Palas milk population	Daily average increase within the period of 1-28 days (g)	55	$201.4 \pm 5$	18.41	60	$181.1 \pm 5$	21.31
	Daily average increase within the period 28 days- weaning (g)	55	$179.0 \pm 12$	49.71	60	$182.0 \pm 14$	59.58
	Daily average increase within the period 1 day- weaning (g)	55	$195.5 \pm 16$	60.69	60	$181.8 \pm 15$	63.91
Palas prolific population	Daily average increase within the period of 1-28 days (g)	44	$221.8 \pm 7$	20.93	63	$183.2 \pm 5$	21.66
	Daily average increase within the period 28 days- weaning (g)	44	$171.4 \pm 14$	54.7	63	$166.4 \pm 11$	52.46
	Daily average increase within the period 1 day- weaning (g)	44	$205.0 \pm 13$	42.06	63	$181.4 \pm 12$	52.51

The kids from the experimental lot had at birth  $2.90 \pm 0.05$  kg, at the age of 28 days  $7.70 \pm 0.12$  kg, at weaning, at the age of 48 days  $11.27 \pm 0.25$  kg and obtained the following increases in weight: in the period of birth-28 days  $171.4 \pm 2.8$  g/day, in the period 28 days–weaning (48 days)  $178.5 \pm 3$  g/day, and for the total of period birth-weaning  $174.3 \pm 3.5$  g/day. The kids from the witness lot, weaned at the age of 75 days had at birth  $2.85 \pm 0.08$  kg, at the age of 28 days  $7.65 \pm 0.23$  kg, at weaning,

at the age of 75 days  $14.32 \pm 0.28$  kg and obtained the following increases in weight: in the period of birth-28 days  $171.4 \pm 3.7$  g/day, in the period 28 days– weaning (48 days)  $141.9 \pm 2.9$  g/day, and for the total of period birth-weaning  $152.9 \pm 2.9$  g/day. The female kids from the experimental lot had at birth  $2.63 \pm 0.04$  kg, at the age of 28 days  $6.72 \pm 0.21$  kg, at weaning, at the age of 48 days  $9.73 \pm 0.28$  kg and obtained the following increases in weight: in the period of birth-28 days  $146.1 \pm 3.9$  g/day, in the period of 28 days– weaning (48 days)  $150.5 \pm 2.8$  g/day, and for the total of period birth-weaning  $147.9 \pm 2.8$  g/day. The female kids from the witness lot, weaned at the age of 75 days had at birth the weight of  $2.72 \pm 0.07$  kg, at the age of 28 days  $6.78 \pm 0.19$  kg, at weaning, at the age of 75 days  $13.12 \pm 0.31$  kg and obtained the following increases in weight: in the period of birth -28 days  $145.2 \pm 3.1$  g/day, in the period 28 days – weaning (75 days)  $134.8 \pm 2.7$  g/day, and for the total of period birth-weaning  $138.6 \pm 2.7$  g/day.

**Table no. 5**

Evolution of early and traditionally weaned Carpatina breeds kids' body weight

Specification	Experimental lot Weaning at 48 days				Witness lot weaning at 75 days			
	Males (n=16)		females(n=18)		Males (n=25)		Females (n=20)	
	$\bar{X} \pm sx$	V%	$\bar{X} \pm sx$	V%	$\bar{X} \pm sx$	V%	$\bar{X} \pm sx$	V%
Birth weight (kg)	$2.90 \pm 0.05$	6.89	$2.63 \pm 0.04$	6.45	$2.85 \pm 0.08$	14.03	$2.72 \pm 0.07$	11.51
Weight at 28 days (kg)	$7.70 \pm 0.12$	6.23	$6.72 \pm 0.21$	13.25	$7.65 \pm 0.23$	15.03	$6.78 \pm 0.19$	12.53
Weaning weight (kg)	$11.27 \pm 0.25$	8.87	$9.73 \pm 0.28$	12.21	$14.32 \pm 0.28$	9.77	$13.12 \pm 0.31$	10.56
Increase of weight (g) 0-28 days	$171.4 \pm 2.8$	6.53	$146.1 \pm 3.9$	11.32	$171.4 \pm 3.7$	10.79	$145.2 \pm 3.1$	9.54
Increase of weight (g) 28 days-weaning	$178.5 \pm 3.5$	7.84	$150.5 \pm 2.8$	7.89	$141.9 \pm 2.9$	10.21	$134.8 \pm 2.7$	8.95
Increase of weight (g) birth-weaning	$174.3 \pm 3.5$	8.03	$147.9 \pm 2.8$	8.03	$152.9 \pm 2.9$	9.48	$138.6 \pm 2.7$	8.69

In order to avoid the losses caused by the inadequate development of the early weaned lambs and kids a very close surveillance of these animals was performed and also an individual weighing took place every week and then at weaning. Beside the normal weight it was noticed that the early weaned kids had a harmonious development, an adequate conformation, proved to have a brisk behaviour, a robust build. There have not been any sicknesses reported to the kids, continuing to supervise the development of evolution.

### Conclusions

1. The superposition of the sheep milking over the servicing period and the first two months of gestation determined an increase of milk production for the Palas milk population of sheep with 14.58%, in comparison with the milk production obtained from the sheep weaned before the servicing period and a milked milk production greater with 45.61%.

2. The goats belonging to Carpatina breed from ICDCOC Palas had a total milk production which was 30.4% greater to the goats with prolonged lactation in comparison with the goats that were weaned before the servicing period.
3. The total average milk production from the goats belonging to Carpatina breed from the breeder was 24,0% greater to the pregnant goats which were milked, in comparison with the production of sheep which were weaned before the servicing period.
4. For the increase of merchandise milk production the early weaning of lambs and kids was performed, obtaining the following results: the lambs belonging to Palas Merino breed were weaned at the average age of 44 days and having the weight of  $14.78 \pm 0.25$  kg males and  $14.34 \pm 0.27$  kg females; the lambs belonging Palas milk population were weaned at the average age of 38 days and having the weight of  $12.05 \pm 0.22$  kg males and  $11.16 \pm 0.51$  kg females; the lambs belonging to Palas prolific population were weaned at the average age of 42 days and having the weight of  $13.28 \pm 0.71$  kg males and  $11.97 \pm 0.35$  kg females; the kids belonging to Carpatina breed at the weaning time, at the age of 48 days had the weight of  $11.27 \pm 0.25$  kg and the female kids at the same age had  $9.73 \pm 0.28$  kg.

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