

## Milk supply of rabbit kits

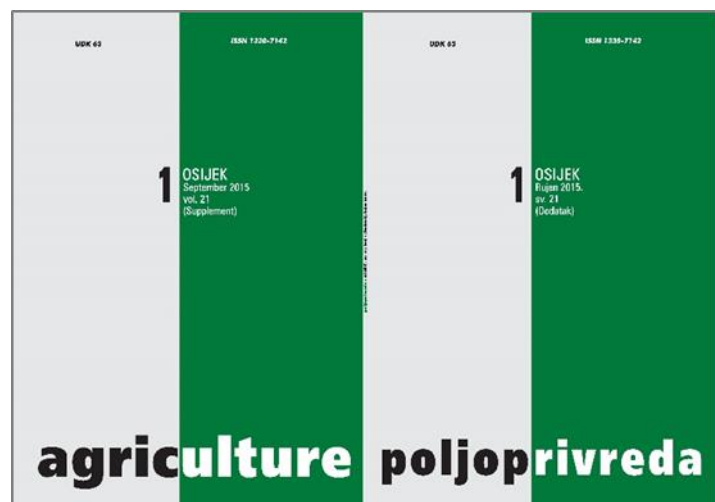
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# MILK SUPPLY OF RABBIT KITS

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Scientific review

## SUMMARY

*In general, rabbit does nurse the kits once-a-day for 3-4 minutes. During this time the kits are able to consume their daily feed requirement, which is about equal to 1/6 of their body weight. The milk intake, body weight gain and survival of the kits depend on the milk production and their mother nursing willingness. However, the does are not able to cover the nutrient requirements of the suckling kits, especially on the 3<sup>rd</sup> week of lactation. The goal of this study is to examine the nutrient supplementation of nursing kits and to highlight the deficiencies of the nursing systems. The study summarizes the effect of using two nursing does per litter.*

**Key-words:** milk production, suckling kits, nursing

## INTRODUCTION

Several scientists have examined the methods of increasing the body weight and the weight gain of the rabbits during the fattening period. On the other hand, the possibilities of taking advantage of the growth potential of the rabbit kits before weaning have been studied in few papers. In this study we summarized the main scientific results in this field.

## MILK SUPPLEMENTATION OF SUCKLING KITS

Rabbit does nurse their kits once a day (24h) with circadian periodicity (Zarrow et al., 1965; Drewett et al., 1982; Jilge and Stahle, 1993; Morgado et al., 2008). The kits have to consume their daily feed intake in a short nursing time, being about 3-4 minutes. It means that they are able to consume milk equal to 1/6 of their body weight (Lebas, 1975). According to other scientists it can even reach the 35% of their weight (Morgado et al., 2008). That is why they can double their birth weight till the age of 6 days (Davies et al., 1964).

The circadian nursing periodicity can be observed in the behaviour of the kits as well. The rabbit kits spend the day in the nest covered by hair (Hudson and Distel, 1982). The kits provide their body temperature huddling together in the nest, thus they can minimize their energy expenditure. Just before the nursing time (2-2.5 hours) the kits become active, they move to the top of the nest and their body temperature increases. With this process they prepare themselves for the arrival of the doe to suck as soon as possible (Caba and González-Mariscal, 2009). According to Jilge et al. (2000) the average body

temperature (24 hours) of the suckling kits increases by 0.5% just before the mother arrival, however during the nursing process it even increases by 0.3-0.6%.

Even so, other scientists observed two or three nursings a day. According to Hoy and Selzer (2002) in a "free-range" system, the number of daily nursing events reached 2-3 events per day at the second week of the lactation. They also observed the main nursing period of the domesticated rabbit which was between 7 and 9 p.m. This finding is in close connection with the observation of Seitz et al. (1998). In their experiment the rabbit does visited the nests 0.8-2.2 times a day, and the average duration between two nursing events was 16.5 hours. Matics et al. (2004) published similar results.

Till the 9<sup>th</sup> day of the lactation 25% of the does nursed their kits more than once in 24 hours, later, between the 10<sup>th</sup> and 16<sup>th</sup> day of lactation the frequency of more nursing events per day decreased a little (21%). The frequency of daily nursing events increased as well, when the previously controlled (once-a-day) nursing does had free access to the nest (to the kits). Other experiments showed that the frequency of the nursing events can be increased by changing their time (let the does into the nest earlier than usual) (González-Mariscal, 2006).

Until the age of 15-18 days, the kits can consume only milk. Compared to some other domesticated animal species (as shown in Table 1), the fat and energy content

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of the rabbit milk are quite high (Maertens et al., 2006). During the first part of lactation the milk is enough to satisfy the high energy needs of the kits. However, from the beginning of the third lactation week, the does are not able to satisfy the nutrient requirement of the kits (Gyarmati et al., 1999; Parigi-Bini et al., 1992; Xiccato et al., 1995; Xiccato et al., 1999). The growth and the survival of the kits depend on the milk production and on the does behaviour. Due to the lack of the milk, the hunger will lead the kits to start consuming solid feed. The less milk, the sooner and faster they eat solid feed.

By utilizing the high growth potential of the kits, they could reach the slaughter weight at younger age. The effects of the better nutritional status of the suckling kits on the production are an important and unanswered question.

**Table 1. Milk yield and milk composition of some domesticated animals (Maertens et al., 2006)**

	Hybrid rabbit	Pig	Dairy cow
<b>Live weight (kg)</b>	4.2	230	650
<b>Peak of milk yield (kg/day)</b>	0.3	8.9	47.5
<b>Fat content of milk (g/100 g)</b>	12.9	6.5	3.5-4.0
<b>Protein content of milk (g/100 g)</b>	12.3	5.1	3.0-4.0
<b>Energy content of milk (MJ/kg)</b>	8.4	4.5	2.7-3.2

### USING TWO DOES FOR ONE LITTER

Herczeg (1981) tried to force one doe to nurse its kits twice a day, but the kits did not grow faster. A few years later Spencer and Hull (1984) published a new and efficient technique: nursing one litter with two does. In this experiment rabbits were used as the animal model to examine the effect of overfeeding human babies. A few years later McNitt and Moody (1988) carried out an experiment with meat-type rabbits. Despite of the experiment success, this method had not become a practical method on rabbit farms.

In the experiment of Gyarmati et al. (2000) - till the age of 21 days - the kits were nursed by two does and they consumed 89% more milk than the control group, which led to a 70% higher body weight at the age of 21 days. The kits were able to keep the higher body weight through the fattening period, so they reached the slaughter weight (2.5 kg) 9 days earlier than the control group. The results of Szendrő et al. (2002) confirmed this outcome. In their experiment the difference between the two groups was +6-7% in favour of the experimental group.

By the refinement of this method, Szendrő et al. (2001) published a farmer-friendly method, where the kits in the experimental group - nursed by two does - reached the slaughter weight (2.5 kg) 5-6 days earlier. Reproduction rhythm of 42-day with two groups of does was used, and they were inseminated 21 days after

each kindling. Two does were housed in special, larger (95x54 cm) wire-mesh cages, halved into two independent parts for the two does, with two closable doors into the large nest box. The doe that kindled nursed its kits in the morning, while the other (foster) doe (weaned their kits at 21 days) had free access to the nest box from 3 p.m. to the next morning.

According to the results of Gyovai et al. (2004) there were major differences between the two groups (nursed by one or two does) at the end of the first week. They investigated the production and reproduction performance through their life. Significant differences were in body weight and condition at first insemination. Total number of rabbit born was 9% higher in group nursed by two does. The best results were achieved when the does in their young age were nursed by two does and then fed restricted till the first insemination (60.3 kits born total/year) compared to the traditional method (nursed by one doe and fed *ad libitum*; 53.1 kits born total/year). Overfeeding the suckling kits results in better condition in adult age, which is the base of the long-life production (Xiccato, 1999).

In summary, the milk consumption of the kits can be higher by using two nursing does. The kits will have an increased appetite, lasting after the weaning, so the rabbits will consume more feed during the fattening period. Nursing by two does have beneficial effect on growing rabbits and rabbit does. The weakness of this method consists in the needs of more work and more practice, accuracy, increased space (unique cages) and early kits weaning.

### CONCLUSION

According to the results, a satisfactory covering of the nutrient requirements of the suckling kits is a relevant and important task.

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