

abstract

The cooling of dairy cows in Israel was based for many years on cooling in the waiting area or in a special cooling yard. In many farms, a routine of three cooling sessions before milking and another 2 to 5 cooling sessions between milkings is common. Such a cooling routine is a difficult task for the staff who bring the cows to the cooling yard and take them back to the resining area and a disruption to the cows' rest routine. In recent years, farms in Israel have switched to an intensive cooling management which based more on cooling along the feeding line and less on cooling in the waiting yard. In such a cooling routine the cows spend less time going to the cooling yard and more time eating and resting and it is possible for the cows to have access to the cooling along the feeding line which operates for many hours throughout the day. The intensive cooling management usually includes large fans, high flow rate sprinklers with widespread distribution and operation for many hours along the day. Intensive cooling along the road will allow the cows to choose for themselves the time when they wish to lower their body temperature and alleviate heat stress.

A number of farms that have installed such an intensive cooling systems in recent years report a significant improvement in summer milk production and fertility rate. In light of all this, the need arose to carry out a scientific experiment which would make it possible to evaluate the effect of intensive cooling along the feed line on the cows' performance and to compare it to the regular routine which is mainly based on cooling in the waiting yard.

The experiment was carried out in the summers of 2021 and 2022 in a kibbutz farm in the Zevulun Valley area. Two similar groups of mature cows were compared. In the experimental group's yard, an intensive cooling system was installed along the feed line. This system operated for about 14 hours a day. This group received three cooling session in the waiting yard before milking, but did not receive additional cooling in the waiting yard between milkings. In contrast, the control group did not receive any cooling along the feed line. This group was cooled three times before milking in the waiting yard and three more times between milkings. The experiment was conducted in the summer months (July, August, September). During the month of October, the cooling hours for both groups were gradually reduced and at the beginning of November the cooling session were stopped altogether. Cow's performance monitoring continued until the end of December when all the data was collected and a statistical analysis was performed. The second part of the experiment was carried out in the summer of 2022 in the same farm with two similar groups of first calf heifers and with the same protocol as the previous year.

In 2021, a statistically significant difference was found in the decrease in milk yield between July and August. No statistically significant differences were found in the rest of the data (conception rate at first insemination, SMC, protein and fat in milk). In the summer of 2022, the .recovery of cows without cooling in the feeding line was faster

We found an advantage for the experimental group (with cooling on the feed line) in the first year. In the experimental group there was a moderate decrease in milk yield at the beginning of the summer. In the summer of the second year of the experiment, an advantage was found for the group of first calf heifers who did not receive cooling in the feed line. This may be due to a different microclimate between the yards or too short operating hours of the cooling system

along the feed line. Even if we did not find a difference between the two groups, still in cooling along the feed line there is a considerable advantage in labore and less transport of cows to the cooling yard and back. In farms that have installed cooling systems along the feed line in recent years, several types of fans and sprinklers/foggers have been used. Therefore, there are still no established recommendations regarding the recommended characteristics of these system.