

LIGHTING FOR ANIMALS

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**Program for lighting
for dairy cows aiming
at stimulation of the
milk yield.**

Annotation

A program for lighting for dairy cattle of the Holstein breed was started in order to increase the production of milk on 01.10.2012 at the farm of Rumkomilk Ltd., the village of Dragor, Pazardzhik municipality. For this purpose, a lighting system developed by IRA-D LTD. for lighting of cows was installed in shed No 2 of the farm. Shed No 1 is situated near Shed No 2, in which there are also dairy cows from Holstein breed but a non-profession lighting system is used there.

The objective of the project is to compare the results obtained in the two sheds and analyze the economic effect of the lighting program.

Throughout the duration of the project, all cows in both sheds had the same regime of feeding and drinking, regime of daily walking and veterinary service.

Nature and purpose of the lighting program

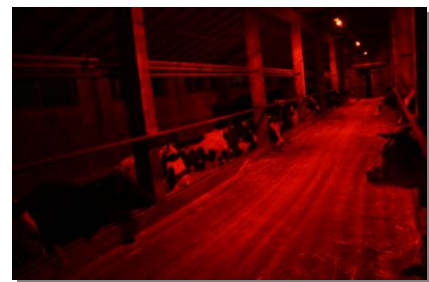
A lighting system developed by the company IRA-D LTD. was installed in shed No 2. The lighting system consists of LED lighting fixtures **IR AL 121 LED R** and a block **BM AL IR121 LED R** for automatic control of the regimes of lighting.

The used program consists of a sequence of light regimes. This sequence is consistent with the age of the cows, their lactation or dry period, their insemination, etc.:

1. Photoperiod: Depending on the age, dry or lactation period, the sexual maturity of the cows, the respective wave length of the photoperiod is selected /light and dark time of the twenty-four-hour period/.

2. Intensity of light: The intensity of light is calculated in such values that the light period is to be perceived by the cow as a day and the dark one – as night.

3. Light spectrum: The program works with two main spectra of light. One of the used spectra stimulates the process of milk secretion in cows and the second one prepares the cows for night's rest, relaxation and full restoration of the organism.



Achieved results

1. Note of the operators:

-Throughout the whole period of the project, the cows perceived the additional light in a calm manner.

-The nocturnal red regime quickly predisposes them to rest and this influences their thorough recreation.

-The lighted cows increased the milk yield compared to the unlighted cows by an average of 2.5 litres daily over a period of one month after the start of the program.

-No difference in the amount of the milk among the lighted cows is observed.

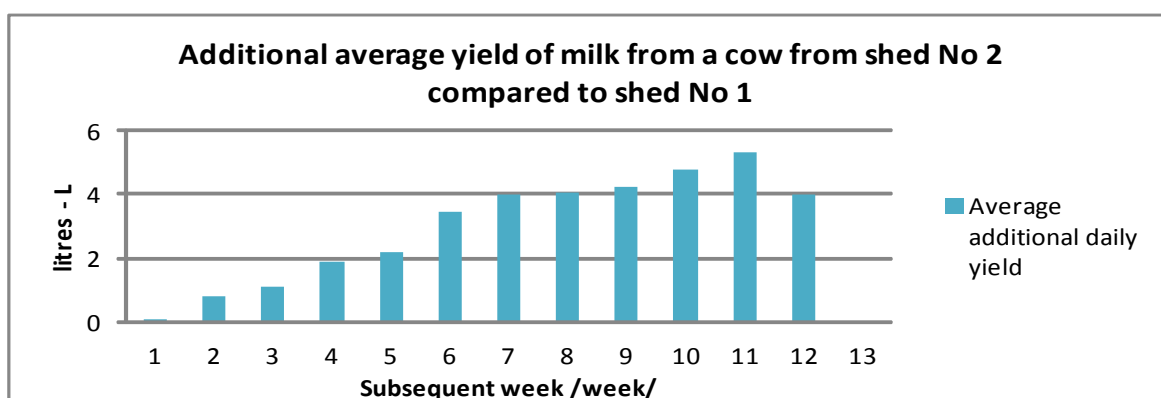
2. Achieved real results

Table 1 specifies the difference between the average yield of milk per cow in the lighted shed No 2 compared to the average yield of milk per cow from shed No 1 with non-professional lighting. The period of observation and analysis of the results is from October until December 2012.

Note: Subsequent weeks 10 and 11 had a lot of cloudy days.

Table 1:

Subsequent week	1	2	3	4	5	6	7	8	9	10	11	12	13
Calendar week	40	41	42	43	44	45	46	47	48	49	50	51	52
Average additional daily yield	0,1	0,8	1,1	1,9	2,2	3,48	4,02	4,08	4,21	4,8	5,33	4,01	



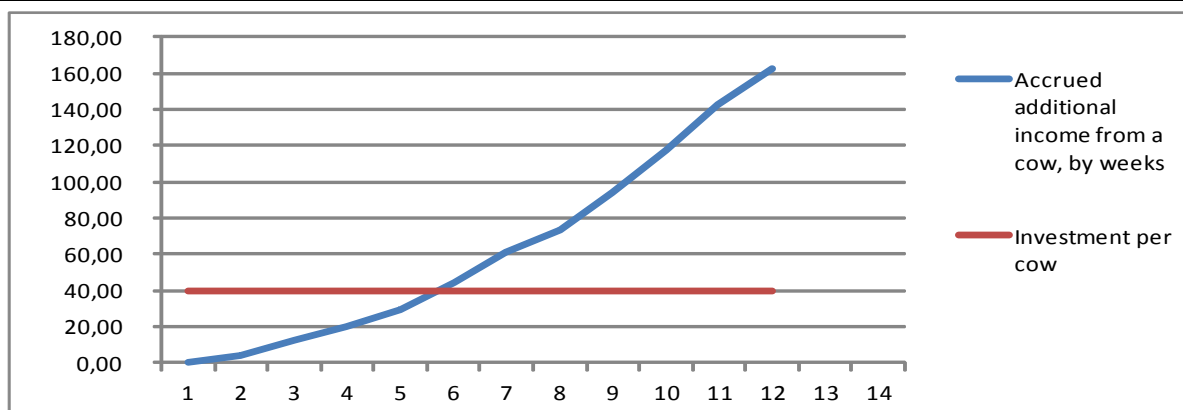
Economic efficiency

Table 2 shows the accrued income from the additionally obtained milk from a cow per week. The calculation is done on the basis of purchase prices of 0.60 leva/l for the months October and November and 0.70 lv/l for December. The value of the investment for the construction of the lighting system per one cow is specified as a basis of comparison.

It can be seen from the table that the returning of the investment is done within 5-6 weeks.

Table №2:

Subsequent week	1	2	3	4	5	6	7	8	9	10	11	12	13
Accrued additional income	0,42	4,07	12,34	20,32	29,56	44,18	61,06	73,2	93,82	117,3	143,1	162,7	
Investment per cow	40	40	40	40	40	40	40	40	40	40	40	40	



Acknowledgement

The company IRA-D LTD. expresses special gratitude to Mr. Rumen Georgiev, owner of Rumkomilk Ltd. for giving us the chance to realize the project, the thorough cooperation during the project implementation and the provided results.