

Dairy farmer, don't pay double tax in the summer

Israel Flamenbaum

(Cow Cooling Solutions Ltd, Israel)

www.cool-cows.com

Taxation on the dairy activity varies from country to country. Some countries exempt farmers from paying income tax, others reduced tax rates and some countries ask dairy farmers to pay full tax on their income. However, no country exempts the dairy farmers from paying "tax to the summer", which is paid due to lack of coping with the summer heat stress negative effect on their cows.

How much is this tax rate? , this is of course different from country to country and depends on climate conditions (the number of hours per year in which cows are subjected to heat stress conditions), the level of production of the cows as well as farm management practices.

Is it possible to avoid or at least significantly reduce this tax payment? , the answer is definitively yes!

In this article, I will attempt to define the tax paid in various climatic conditions, to describe the factors leading to its payment and finally and most important, to show (based on published researches and findings from recent projects in different parts of the world, I am involved in), to what rate, this "unnecessary tax" can be reduced.

The first step when studying the subject is to learn the changes occurring when dairy cows are subjected to heat conditions, and how these changes cause this tax payment. In this article I am listing six main factors (not necessarily in order of importance), and most probably, there are others which are not mentioned here.

- Heat stress reduce cow's annual milk production – as cow's production is increased, the amount of food needed to produce a liter of milk is lowered (this is because the amount of food required for maintenance is constant and identical to a cow producing 10 or 50 liters of milk per day). Thus, the production of a liter of milk in cows, spending part of their lactation under heat stress condition, is more expensive and estimates can vary between 5 and 20% (depending in rate of decline in their annual milk production).

- Heat stress causes a reduction in "feed efficiency" - Cows under heat stress conditions divert part of the energy consumed to activate mechanisms for regulation of body temperature. This energy is subtracted from that needed to be directed to produce milk. Studies estimate that approximately 10 to 15% of feed energy is diverted to "nonproductive" purposes when cows are subjected to heat stress conditions, leading to a decline in the efficiency feed is converted into milk.

- Heat stress reduces milk fat and protein content and an increase SCC content - production under heat stress conditions can cause a decrease of 2-4 percentage points in milk fat content and 1-2 percentage points in milk protein content. When cows are subjected to heat stress conditions somatic cells (SCC) in milk can be increased by about 100,000 units and all these changes can lead to a reduction in farm output, from economic point of view.

- Heat stress negatively affect cow's fertility - the reduction in cow's fertility traits is caused by combining a reduction in heat detection and conception rates, leading to a prolongation in "calving interval" and an increase in the rate of cows culled from the herd annually, due to fertility problems. Studies show that heat detection rate under heat stress conditions is about 50% of that reached in normal temperatures. Conception rates to inseminations given in the hot season are reduced to an half, or even less, than those obtained in thermal comfort conditions.

- Heat stress reduce the immunity of the cows and increases morbidity rates - Cows exposed to heat stress conditions, especially in the stages around calving, tend to develop infections at a higher rate and suffer slower recovery rates, leading to a reduction in their annual milk production and an increase in the culling rate.

- Heat stress in the dry period reduce their production in subsequent lactation – The presence of dry cows under heat stress conditions causes physiological changes, negatively affecting the development of the fetus and its necessary induction on udder tissue development, leading to lower milk production in early lactation. Researches carried out recently show that these cows will reach a subsequent lactation, which is only 90-95% of their normal potential.

How much is the "summer tax" paid by the farmer due to summer heat stress?

In order to answer this question, I will make use data from a survey conducted in the US. Climatic data from each of the US states was collected and the expected drop in cow's performance was presented. Based on this data, the researchers calculated the economic losses caused to a dairy farm in each of US states.

In my article I will present from one side, data taken from farms, located in northern California, with 1-2 stressful months per year, as representing countries with temperate climates, such as Western European and North American states, and from the other side, data from dairy farms in Florida and Texas, as representing Southeast Asia, Central America, and the Caribbean, with six to eight months of heat per year.

The findings of the survey indicate a milk yield (under no measures to ease heat from cows), ranging from 300 to 2000 liters per year in both regions, respectively, while the loss in annual income per cow is expected to range between \$ 100 and \$ 700.

Based on the survey data, it one can quantify the extent of the reduction in the annual performance of the cows and the extent of the financial losses to the farm (in other words, the "tax" farm is forced to pay each year due to summer heat stress). This "tax" to be paid is expected to range from 5% of farm total revenue from milk sells, in farms located in temperate regions to more than 15% of the revenues, in farms located in extremely warm regions.

Is it possible to avoid or at least reduce this "tax" payment?

To answer this question, I reused the survey data, also included calculations that I made based on results from cow cooling projects, in which I am involved in different parts of the world.

The economic benefits of cooling cows was studied, based on the survey data above mentioned. The researchers compared the economic losses caused by summer heat stress to Florida cows, when no cooling was provided, to those, expected to occur when cow cooling systems, as those appearing in scientific publications were put in practices and positive results were reached. Researchers assume that the difference between the two scenarios reflect the additional net income expected to be obtained when cows are properly cooled in the warm season, and in other words, the farm is supposed to pay less "tax to heat stress". When putting it in numbers, it can be said that properly cooling the cows can reduce annual milk production losses per cow from 1,600 liters, when no cooling is practiced to 200 liters, when cows are properly cooled. In economic terms, properly cooling the cows in the summer reduce farm annual income losses per cow, caused by summer heat stress, from \$ 700, when cows are not cooled at all, to 125 \$, when cows are properly cooled. It can be concluded that, properly cooling the cows in Florida can contribute to additional 1,400 liters of milk production and 575 \$ income per cow, annually. In other words, "tax payment" by farm to nature in this case was reduced by 80%.

In recent years, I have been accompanying several cooling projects in several countries, among them, Mexico, Argentina, Brazil, Italy, Spain, Turkey, Russia and China. Data from these projects has recently been recently processed and published in articles in farmer magazines in different countries.

Based on the results of these projects, it could be seen that, adapting cooling procedures to each farm conditions, contributed to an increase of 6 to 10% in cow's annual production, reduce to an half the summer decline in conception rate and improve by 5 to 10% the efficiency of feed conversion to milk.

Similar to the data from the survey presented earlier in this article, we can find also in these projects that intensively cooling the cows in the summer have the potential to reduce by 200 – 500 \$ the "heat stress tax" to be paid annually by the farm. In other words, properly cooling the cows can reduce farm "summer tax" by more than 50%.

In conclusion, the presented in this article indicate that the tax payment by farms different regions of the world can be significantly reduced, when farm implements recommended cooling means in the summer. Investing in cooling means is one of the most worthwhile investments that farms around the world can make, an which may be returned in less than two years, after which, **the farm simply stop paying double tax in the summer.**