

# The Reform in the Israeli Dairy Farms 1999-2008

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While milk production per cow in Israel is among the highest in the world, dairy farms are major polluters of the environment. Potential environmental problems include soil and water source contamination caused by nutrients, nitrates, brines, organic matter and pathogens as well as stench, flies and aesthetic degradation.

There are about 120,000 milk cows in Israel, producing about 1.124 billion liters of milk per year. It is estimated that one cow equals about 20 people in terms of potential water pollution caused by organic material (BOD) generated per day. **Thus, the pollution generated by some 398,000 heads of cattle in Israel, including both milk and beef cows, exceeds the pollution generated by the entire human population of the country.**

## Aims of the Dairy Farm Reform

In 1999, a reform package was initiated in the dairy sector, which continued until 2007. The main aims of the reform are as follows:

- Encouraging dairy producers to become larger, more competitive and more efficient;
- Preventing pollution from dairy farms and protecting the country's water sources by upgrading cowsheds and establishing environmental infrastructure.

In the first five years of the reform (until the end of 2004), dairy farm owners could present engineering plans for approval to the Ministry of Agriculture and Environmental Protection. The years 2004 - 2006 were devoted to the implementation of the plans and receiving grants. Due to the security situation in the northern region of the country and the vicinity of the Gaza region, an extension was granted to dairy farms in this area to complete implementation until 2007.

## Components of the Reform Project

The reform project resulted from an agreement between the Ministry of Finance, the Dairy Board and the Ministry of Agriculture, with the Ministry of Environmental Protection providing the professional requirements for investments in the cowsheds. The project included financial grants of 50% for investments in infrastructure and systems for environmental protection and 30% for greater efficiency.

Within the framework of the reform, strict criteria were formulated for the environment-friendly operation of dairy farms, largely based on guidelines developed by the Ministry of Environmental Protection. Among others among other what???, guidelines relate to the establishment of proper treatment and disposal facilities including requirements for roofing, cement flooring, drainage systems to prevent release of manure and leachate into the environment, manure collection and containment facilities, separation of solids from the waste stream, and sewage treatment at different levels.

The reform presented a golden opportunity to upgrade environmental infrastructures in dairy farms and to stop this source of environmental pollution.

At the onset of the reform project in 1999, there were 1,453 cowsheds in Israel. During the course of nine years of reform (1999 - 2007), the number of dairy farms was reduced by more than 30% - from 1,453 to 1,010. During this same period, national milk production increased by 102 million liters/year - from 1.124 billion liters in 1998 to 1.226 billion liters by 2008 (a 9% increase). By the end of 2007, 1004 dairy farms (98%) presented plans which were approved and 890 (89%) completed implementation and comply with Ministry of Environmental Protection requirements.



### **Achievements of the Dairy Reform**

During the course of a nine-year reform (1999 - 2007), the following achievements were reached:

- The total number of dairy farms was reduced from 1,453 to 1,010 - more than a 30% reduction.
- 98% of the dairy farms presented plans which were approved and financial grants were determined for them (1004 dairy farms out of 1024).
- 890 dairy farms implemented the reform and comply with Ministry of the Environmental Protection requirements for a "bubble dairy farm" model.
- About 68% of the total approved investment for environmental plans for dairy farms and for the establishment of regional facilities for manure treatment was implemented by the end of 2007.
- During the entire reform period, investments totaling some 979 million shekels were approved for infrastructure and environmental protection facilities, of which 849 million shekels were for dairy farms, 110.5 million for regional facilities for manure treatment and 20 million shekels for wastewater treatment plants, especially in the Negev.

- Throughout the reform period, financial grants in the sum of 493 million shekels were approved for investments in environmental infrastructure, regional manure treatment facilities and wastewater treatment.
- In practice, 336 million shekels were granted for environmental investments in the dairy farm sector.
- Approved grants for environmental treatment constituted about 53% of the total grants which were approved within the framework of the dairy farm reform.
- Total approved investments in the reform package including environmental investments, greater efficiency and grants for purchase of cows were 1,850 million shekels, of which 815 million constituted grants.

### **Major Accomplishments**

Environmental improvement of Israel's dairy farm sector is a major achievement, even by world standards. In the beginning of 2008, most of Israel's dairy farms were environment friendly, constituting a model for a comprehensive solution to one of the most difficult problems associated with cattle raising in Israel.

### **Following is a summary of some of the major achievements:**

1. Some 89% of Israel's dairy farms are regulated from an environmental viewpoint, equipped with infrastructure for the prevention of pollutant infiltration, prevention of manure, leachate and sewage overflow, prevention of rainwater contamination, organized collection of manure in containment facilities, and environment-friendly solutions to wastewater, based, to a large extent, on existing sewage systems.
2. The general dispersion of dairy farms in Israel has been preserved, including fodder growth areas, which are considered to be open spaces and may be used for the application of effluents and sludge generated by urban wastewater.
3. The wastewater generated by the dairy farm sector, equal in scope to the wastewater produced by some 6 million residents, is absorbed and treated in local or regional sewage systems.
4. Unique dry technologies based on local development, which reduce environmental nuisances such as stench and fly infestation associated with wet processes, were introduced.
5. New technologies were imported which significantly reduce water consumption and wastewater generation.
6. More than 25 small wastewater treatment plants, on settlement or regional level, for the treatment of wastewater and cowshed waste were upgraded, with financing from the reform budget, according to the relative load of these cowsheds on the facilities.
7. In terms of animal welfare, cows have benefited from a larger area and better conditions (20 sq.m/cow instead of 10 sq.m/cow previously), which have an impact on milk production as well.
8. Biogas facilities, which utilize cattle manure for renewable energy generation were developed.

### **Regional Solutions to Agricultural Wastes**

Experience has demonstrated that regional systems are best suited to provide environmental infrastructure and service to farmers, on the one hand, and to help dispose of and treat agricultural wastes, on the other hand. Therefore, centralized manure collection and treatment systems have been set up and upgraded in recent years to deal with the problems generated by the agricultural sector. These facilities comply with infrastructure requirements stipulated by the Ministry of Environmental Protection, including sealing, to prevent pollutant infiltration and measures for leachate collection.

Regional collection and treatment facilities, based on different technologies, have contributed to the dairy farm reform as well. In recent years, investments and grants for 14 programs for the establishment and expansion of regional manure collection and treatment facilities were approved in different parts of the country, from the Galilee in the north to the Negev in the south. Of these, 11 facilities were established, upgraded or are currently being constructed.

Investments in the sum of 110.5 million shekels were approved for regional facilities and grants in the sum of 56.5 million were approved to facilitate their execution. Some 50% of the total stock of cattle in the dairy farm sector is associated with regional facilities.

In addition to providing a cost-effective, efficient and environment-friendly solution to the collection and treatment of dairy farm wastes from individual farms, these wastes are also used for the production of biogas. In the north and south of the country, manure is largely processed into compost while in the central region of the country the manure is utilized for the production of renewable energy.

The production of energy from a renewable source, such as agricultural waste, is a major accomplishment in Israel. With the completion of the planned facilities, about a third of Israel's cows will produce renewable energy in addition to milk.