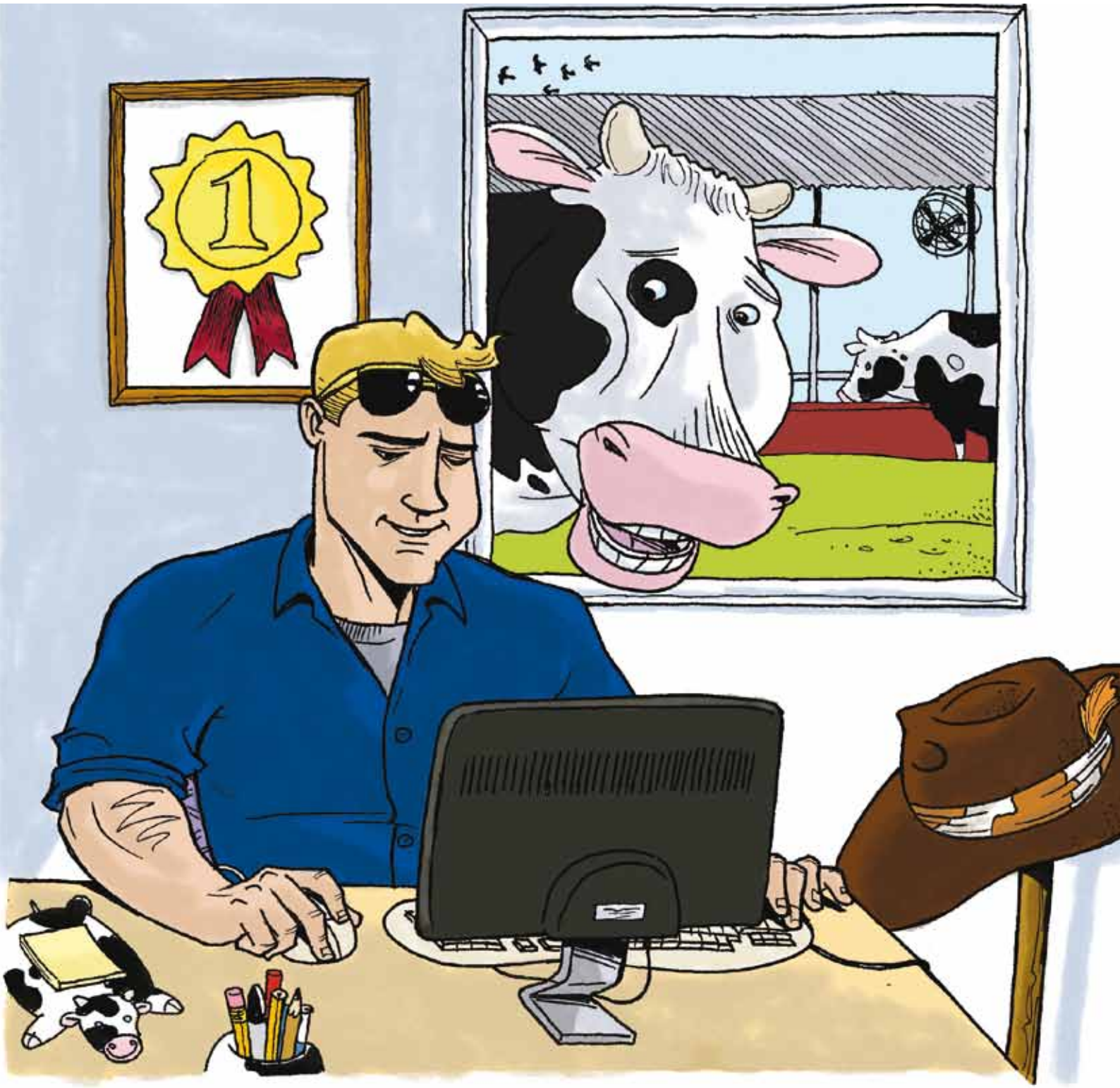
THE DAIRY INDUSTRY IN ISRAEL

2008



Israel Cattle Breeders Association

Israeli Company for Artificial Insemination & Breeding Ltd.

Mutual Society for Clinical Veterinary Services

Israel Dairy Board

The Dairy Industry in Israel 2008

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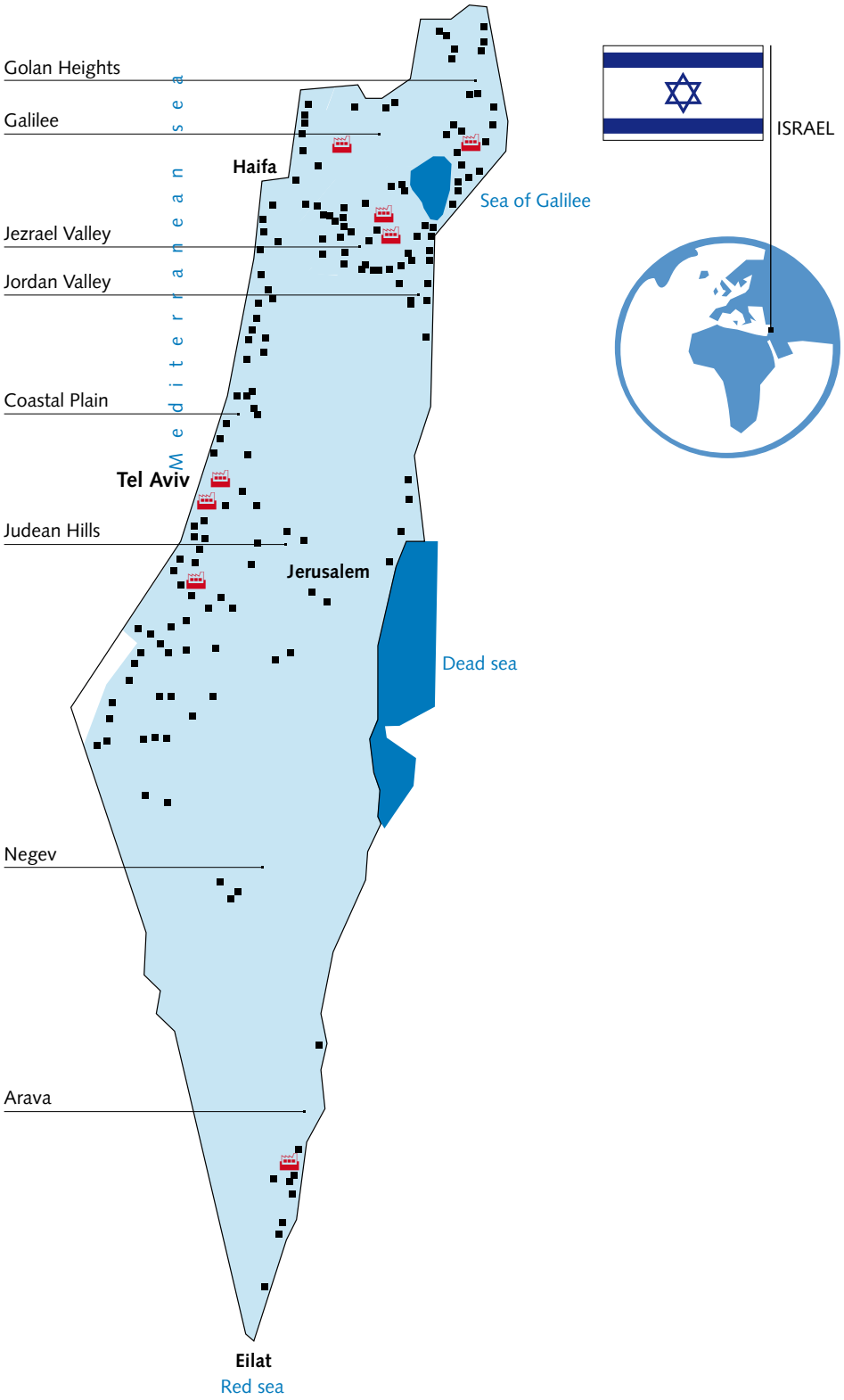
Map of the Dairy Industry in Israel – Main Dairy Plants and Dairy Farms

—Dairy Plants

—Dairy Farms



The Dairy Industry in Israel

The Dairy Industry is one of the leading sectors in Israeli agriculture, and a source of pride to all Israelis. It supplies most of the domestic demand for milk and dairy products, being the rest of the demand covered by imported supplies. Israel has a total annual output of approx. 1.273 millions of liters of cow milk, 9.8 millions of liters of sheep milk and 10.1 millions of liters of goat milk. Those numbers represent the highest milk yield in Israel ever.

The annual value of products being processed is about $1.5 billions. The Israeli milk shelves are filled with over 1,000 different products which are healthy, innovative, tasty, and in row with other state-of- the-art dairy industries.

Milk is produced on 991 farms, spread countrywide. The national dairy herd is comprised of about 130,000 head of the Israeli-Holstein breed, which has been developed by the Israeli Genetic Improvement system. Since this cow has been selected for generations in the harsh conditions of the Israeli climate, it is very well adapted to the local environment – a long and hot summer and several endemic diseases. Nearly all cows are bred by Artificial Insemination.

The Israeli Herdbook (DHI) receives and processes information from the official milk production control system, which includes 90% of the dairy cattle in the country. In addition to production figures, the Israeli Herdbook incorporates information from The Breeding System and from The Society for Veterinary Services – "HaChaklait". The comprehensive structure of the Israeli Herdbook provides the farmer with useful multi-disciplinary information and is used for evidence-based management analyses and decision making processes, which have led to outstanding world-scale achievements. Indeed, the Israeli cow has the highest national milk (production/cow/year) and milk solids yields in the world. In 2008, the average annual milk yield per cow was 11,461 kg of milk, of which 3.29% is protein and 3.71% is fat.

We are pleased to present you with this summary of the Israeli Dairy Industry for 2008 and hope you will understand the reason why the Israeli Dairy Farm has become known as a source of knowledge and pride.

Sincerely,

Shyke Drori
Israel Dairy Board
General Manager

Yaacov Bachar
Israel Cattle Breeders Association
General Manager

The Agricultural Sector in Israel

Rachel Borushek____Israel Farmers' Federation ▸ rachel_b@mail.netvision.net.il

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Table 1.1

Economic and financial data of Israel and its agricultural sector

(1 US$ = 3.59 NIS)

Population	7.31 million inhab.
GDP per cápita	97,700 NIS =27,240 US$
GDP of Agricultural Sector	10.15 NIS Billions = 2.8 US$ Billions
Share of Agriculture in National GDP	1.4 %
Share of Agriculture in the Business Sector GDP	1.9 %
Direct Employment in Agriculture as share of National Labor Force	2.3 %
Self-sufficiency of Agricultural Products	80.0 %

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Table 1.2

Marketing value of agricultural products. Value as received by productor (NIS million)

(1 US$ = 3.59 NIS)

Crops	14,647	58 %
Livestock and livestock products	10.462	42 %
Thereof raw milk	2,760	11 %
TOTAL	**27,869**	**100 %**

Israel's agricultural sector is characterized by an intensive production system, which stems from the need to overcome the scarcity of natural resources, particularly water.

The agricultural sector's high level of development is due to the close cooperation and interaction among scientists, extension advisers, farmers, and agriculture-related industries.

These four elements have joined together to promote advanced technologies in all agricultural branches.

The result is modern agriculture in a country, half of which is defined as desert. Despite the decrease in the number of farmers' and agriculture's share in the GDP, agriculture plays a significant role as a major food supplier to the local market and is an important factor in Israeli export. Total agricultural produce in 2008 accounted for 1.4% of the GDP.

Some 68,700 people were directly employed in agriculture in 2008. This number represents 2.3% of the country's active labor force.

The average monthly income per agricultural self employed was $5,440 in 2008.

Dairy Farming in Israel

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Table 1.3

No. of dairy farms, by farm type, and average annual milk quota per farm (x 1,000 ltrs.)

	2001	2002	2003	2004	2005	2006	2007	2008
Family farms (Moshav)								
Number	1,025	962	921	880	855	843	830	811
Average quota (x 1,000 ltrs.)	492	511	524	541	560	564	589	625
Cooperative farms (Kibbutz)								
Number	209	200	196	187	176	167	165	165
Average quota (x 1,000 ltrs.)	3,273	3,335	3,344	3,524	3,747	3,851	4,030	4,198
Agric. school farms								
Number	16	16	16	16	16	15	15	15
Average quota (x 1,000 ltrs.)	750	731	719	733	746	784	811	853
Total								
Number of farms	1,250	1,178	1,133	1,083	1,047	1,025	1,010	991
Average quota (x 1,000 ltrs.)	960	993	1,015	1,059	1,098	1,102	1,155	1,223

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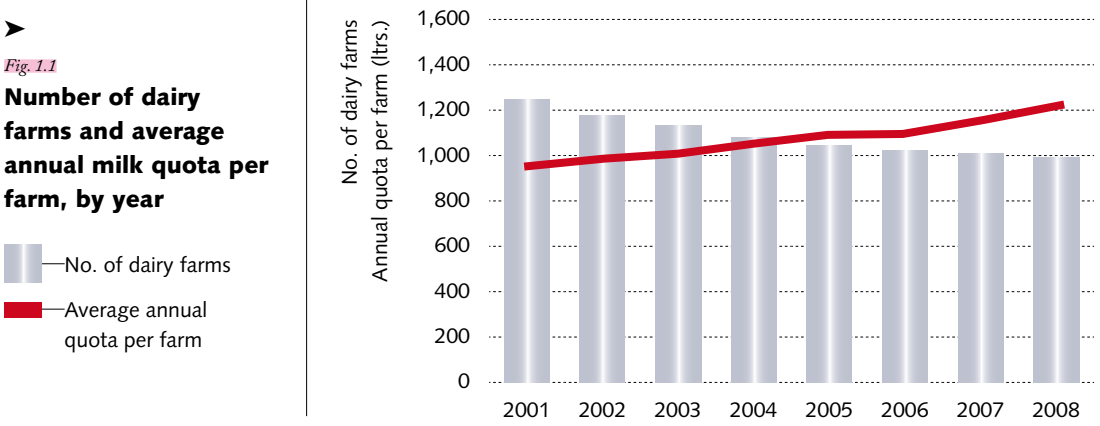
Fig. 1.1

Number of dairy farms and average annual milk quota per farm, by year



Types of Settlement

Much of Israel's agriculture is based on cooperative settlements, which were developed in the early 20th century. The Kibbutz is a large collective production unit. Kibbutz members jointly own the means of production and share social and economic activities. At present, most of the Kibbutz income comes from industrial enterprises owned by the collective unit. Another type of settlement is the Moshav, which is based on individual farms yet organized as a cooperative society. The residents in both types of settlements are provided with a package of municipal services. The Kibbutz and the Moshav currently account for 83% of the country's agricultural produce.

In addition to the Jewish agricultural sector, Arab villages are located in Israel's rural areas. Theses villages focus mainly on production of small livestock (sheep and goats), vegetables, field crops and olives.

All the Kibbutz dairy herds participate in the DHI system and represent 62.2% of the cows with recorded production. Their average milk yield in 2008 was 11,862 kg/cow/year and the average production of protein and fat was 808 kg/cow/year. Approximately 75% of the Moshav dairy herds participate in the DHI system and represent 37.8% of the cows with recorded production. Their average milk yield in 2008 was 10,794 kg/cow/year and the average production of protein and fat was 737 kg/cow/year.

The Israel Dairy Board Production & Marketing

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www.milk.org.il

The Israel Dairy Board (IDB) is a private organisation, jointly owned and managed by the Government of Israel, the major processing companies, and the dairy farmers.

The Board consists of representatives from:

The Government:

- The Ministry of Agriculture and Rural Development
- The Ministry of Health
- The Ministry of Finance
- The Ministry of Industry, Trade and Labour

The processors:

- Tnuva Dairy – CEO & economy
- Strauss Dairy
- Tara Dairy - CEO

The farmers:

- The Israel Cattle Breeders Association – CEO & members
- Israeli Farmers Federations - members
- Israeli Farmers Association

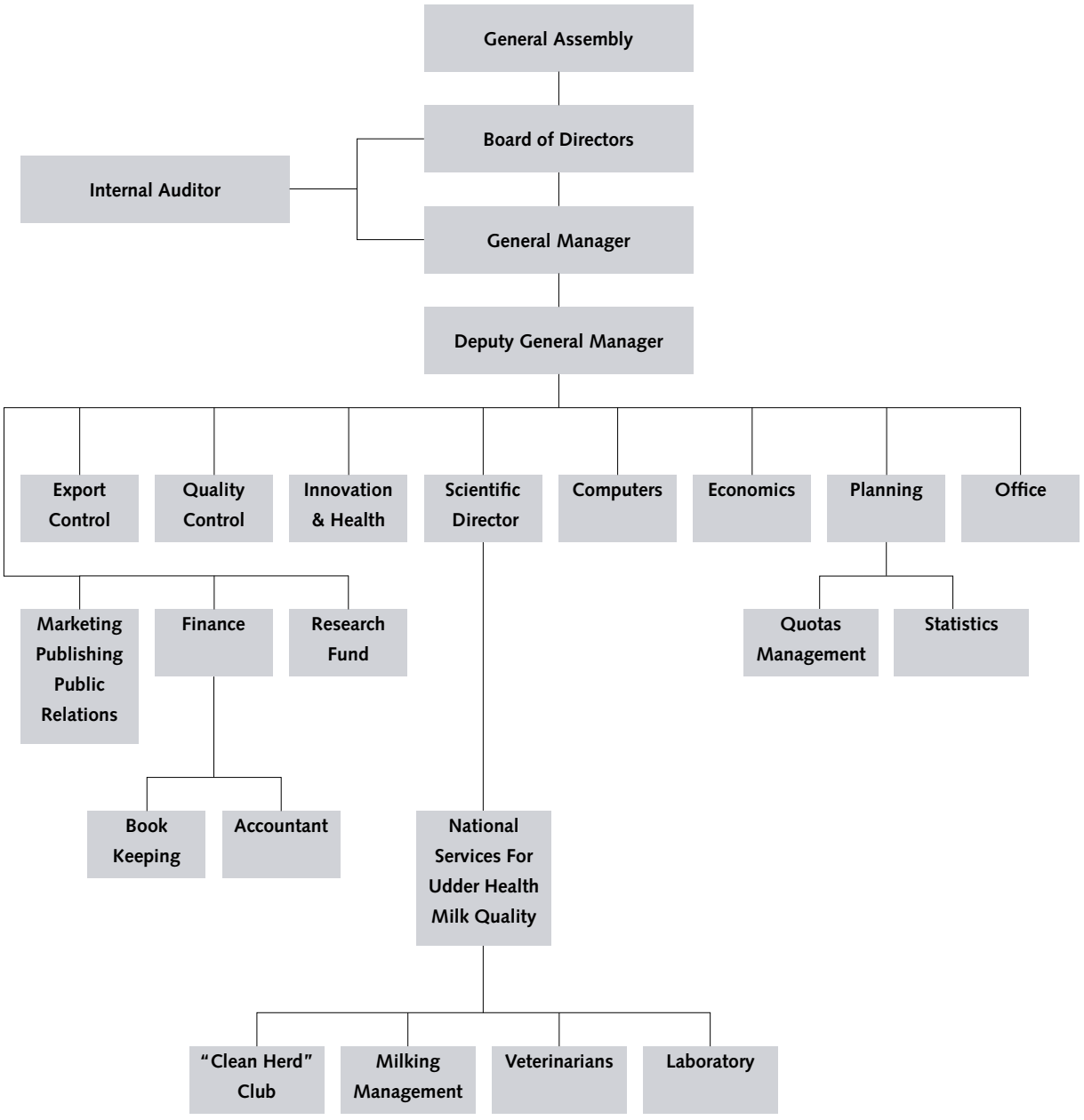
Other Institutions:

- The Jewish Agency

The IDB has the following objectives:

- To generate and organise cooperation among all entities active in the sector.
- To implement the government policy regarding milk-production planning and marketing (including management of quotas).
- To deal with and dispose of surplus milk.
- To improve the professional standards of the dairy industry.
- To promote the consumption of milk and dairy products.
- To manage the beef-cattle market.

Structure of the Israel Dairy Board



Annual Milk Quota and Milk Supply

Cow milk in Israel is produced under a quota system with the annual volume divided into monthly quotas. Because of seasonal fluctuation economic incentives have been set to encourage dairy farmers to regulate monthly production, so that milk supply to the industry is at the desired level throughout the year. Due to the fast increase in the demand for milk products in 2008 the Israel Dairy Board allowed dairy farmers to produce unlimited amounts of milk above their quotas.

The basic milk price paid to the producer is agreed upon between the government, farmers and the dairy industry. This price reflects the average production costs plus an agreed compensation for the farmers' labor and invested capital.

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Table 2.1

Cow milk – annual supply and quota (millions of ltrs.)

Year	Milk supply (millions of ltrs.)	Milk quota (millions of ltrs.)
1997	1,095	1,085
1998	1,126	1,124
1999	1,132	1,124
2000	1,128	1,140
2001	1,174	1,200
2002	1,154	1,170
2003	1,122	1,150
2004	1,146	1,150
2005	1,150	1,150
2006	1,124	1,130
2007	1,166	1,185
2008	1,273	1,212

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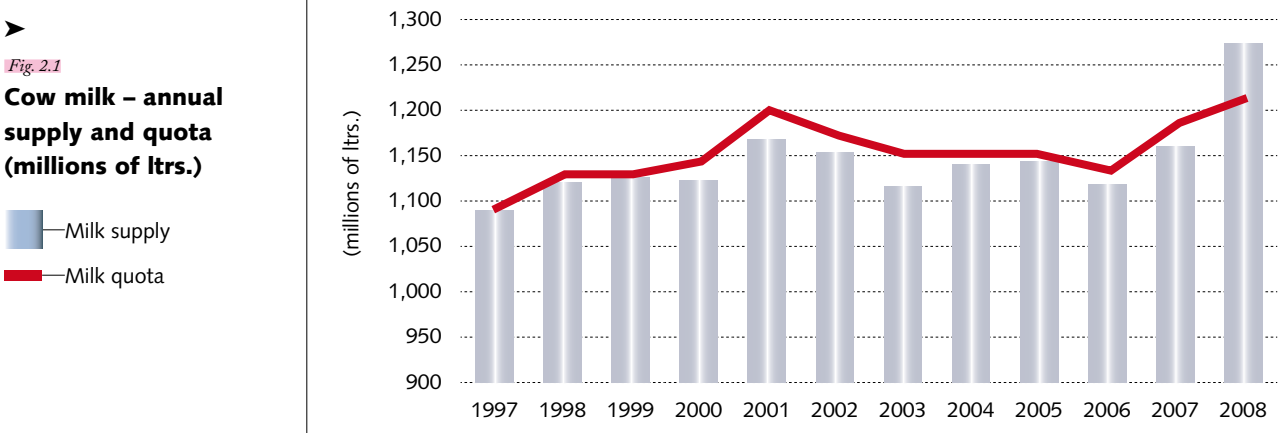
Fig. 2.1

Cow milk – annual supply and quota (millions of ltrs.)



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.

How much milk adds intensive cooling of high-yielding dairy cows during the hot season?

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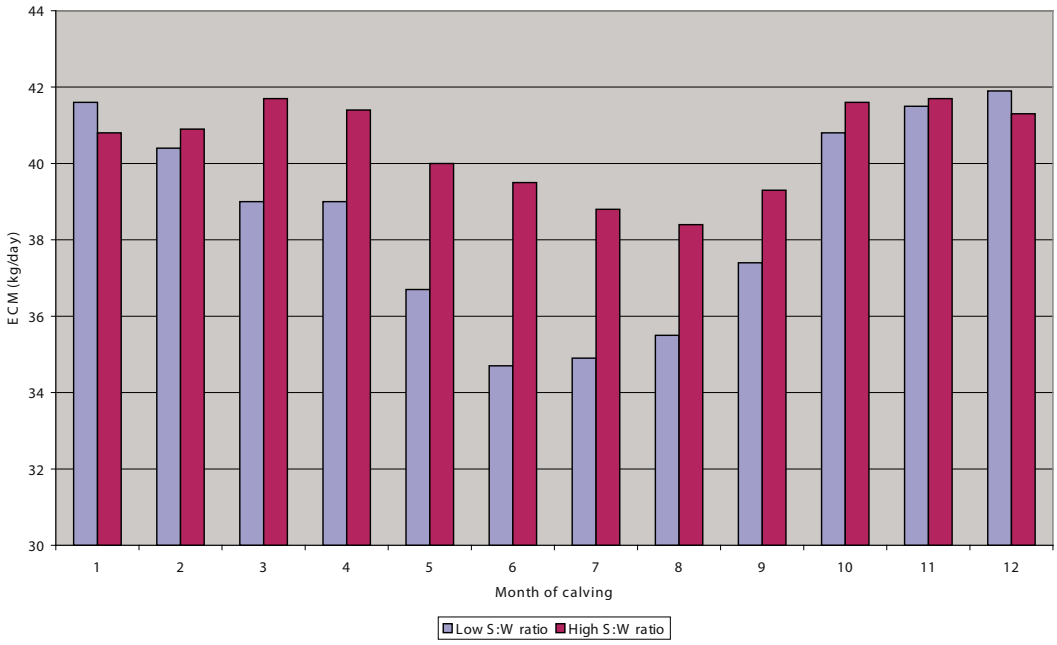
The constant rise in cow-milk yields and global warming are boosting the decrease of milk production during hot seasons in all parts of the world. During the last three decades Israeli researchers have conducted studies and surveys to develop efficient cooling systems which may allow high milk yields during the "heat-stress season".
Technologies for cooling dairy cows are rapidly being adopted by Israeli farmers. Incentive, provided by an appropriate pricing system for milk, has encouraged dairy farmers to install and use these systems extensively. To achieve positive results, proper installation and accurate operation of the cooling system is required.
The Extension Service of the Ministry of Agriculture and the Israel Cattle Breeders' Association (ICBA) Herdbook office have developed an annual report based on farm data, called "The Summer to Winter (S:W) performance ratio". This report, which was recently incorporated into the ICBA herd management system, calculates a series of productive and reproductive ratios based on data for summer (July-September) and winter (January – March). A S:W ratio close to 1 means that the farm handles summer heat stress appropriately and minimizes summer losses. We have found that for milk and ECM yields the S:W ratio ranges between 1.10 (mostly by farms located in mountain regions), to 0.70 (generally small farms that can not afford installing and operating the cooling systems). Total annual production correlates positively with the S:W ratio, which confirms that good management is the key factor in achieving high yields and profitability in dairy farms. This is true in almost every part of the world, especially in hot regions.
The following study was based on data for 2007. S:W ECM (Economical Corrected Milk) ratio was the analyzed parameter so to have better insight of the economical value of cooling. The study compared the 24 "highest" to the 24 "lowest" yielding dairy farms in Israel related to the S:W ECM ratio. The dairy-herd size average was 400 cows. Production and fertility data for the "high" and "low" S:W groups are presented in Table 1.

Table 1
Average ± S.D of milk, ECM , Summer and Winter Conception Rates (CR) at inseminations 1-3 for herds with High and Low S:W performance ratio.

	Low S : W ratio	High S : W ratio
No. Herds	24	24
Winter Milk Production (kg/d)	39.5	39.7
Summer Milk Production (kg/d)	34.4	38.9
S : W ratio	**0.87**	**0.98**
Winter Conception Rate (%)	0.36	0.40
Summer Conception Rate (%)	0.19	0.27
S : W ratio	**0.53**	**0.68**

Graph 1
Corrected averages for ECM production in the first 90 days of lactation, for different months of calving, in herds with high and low S:W ratio.



The fact that winter milk production was similar in both groups supports the supposition that a large part of the differences in the S:W ratio among farms relates to the heat-stress management during the hot season, including proper installations and intensive use of cooling methods. Average ECM production in the first 90 days of lactation, according to month of calving (for both groups) is presented in Graph 1.

It is possible to see that production level in winter was similar in both groups. When considering milk production in complete lactation, the differences between the two groups is due greatly to "summer management". L.SMeans for Milk, ECM, milk fat and milk protein in 305 days of lactation for farms with high and low S:W ratio are presented in table 2.

Table 2
Average 305d production for milk, ECM, milk fat and milk protein, for herds with high and low S:W ratio

	Low S : W ratio Herds	High S : W ratio Herds	Difference (kg)	Added production (%)
Milk (kg)	11,346	12,017	671	6.0%
ECM (Kg)	**11,081**	**11,807**	**726**	**6.5%**
Milk Fat (kg)	402.6	430.1	27.5	6.8%
Milk Protein (kg)	360.9	385.3	24.4	6.8%

The innovative method used in this study allows, for the first time, to evaluate the net effect intensive cooling has on dairy-cow performance. The fact that both high and low S:W ratio groups had similar production levels during the winter months allows us to assert that most of the annual differences in production and fertility were a result of better management, skillful installation and proper operation of the cooling systems.
According to our findings, intensive use of cooling systems during the summer months, under Israeli conditions, adds approximately 700 kg ECM per lactation for each cow - an

increase of 6.5% in its annual production. The extra profit for the farmer (under Israel's quota system) results from the fact that the yearly production can be achieved with 6.5% fewer cows (which save maintenance costs for the additional cows), the extra income for the milk produced and the improvement in feed efficiency in summer. Appropriate management and intensive cooling during the hot season has helped to reduce the summer decline in fertility as well. In the summer, well managed herds maintained a conception rate (CR) of almost 70% of winter level, while low S:W ratio cows reached only 50% of the winter CR level.

The findings of this study enable us to assess the economical effectiveness of installing cooling systems in Israel dairy farms. It would be highly beneficial to carry out similar studies in dairy farms located in different parts of the world.

National Service for Udder Health & Milk Quality

Dr. Shmuel Fridmann____National Service for Udder Health and Milk Quality, Israel Dairy Board ▸ shmulik@is-d-b.co.il

The National Service for Udder Health and Milk Quality is a non-profit organization, whose objective is to improve the udder health and milk quality of all milk producers (cows, sheep & goats) in Israel. The organization consists of a Mastitis Control Laboratory, veterinarians and instructors who are responsible for all farms in Israel that wish to employ their services. Payments for the services provided by the National service for Udder Health and Milk Quality derive from the Israeli Dairy Board budget.
The following services are provided to all dairy herds:

Laboratory diagnosis and services

- During 2008 the lab analysed a total of 107,479 samples.
- The lab is certificated with the Quality Management Standard ISO 17025.
- Analysis of samples from clinical mastitic cows sent by dairy farmers (12,925).
- Analysis of samples sent by farmers from pre-partum cows for sub-clinical mastitis.
- Antibiograms providing information to the clinical veterinarian (3,778 tests).
- Evaluation of teat dip samples from dairy herds (481 samples).
- Bulk tank analysis for Strep. Agalactiae (1,671 samples).
- Analysis of bedding (82 samples).

Para tubercolosis milk test by ELIZA from individual cows and herd level: About 2.6% of Israeli cows were found to be infected with Para tuberculosis; the amount of problematic herds is 14% (a problematic herd has over 5% infectivity).

Udder Health

- Tracing and planning the eradication of contagious mastitis e.g. Strep. Agalactiae 0.3% of cows are infected, Staph. Aureus (less than 2% are infected from all the milik samples send by the farmers).
- Advice during the eradication phase.
- Advice to producers with high Somatic Cell Counts and/ or high cell plate counts.

Planning, implementation, and follow up on programs to combat mastitis in individual cows and on a herd basis.

Analysis of milking parlours and milking equipment

- Advice on milking parlour construction.
- Advice to dairy farmers on milking machine specifications.
- Supervision of companies supplying milking equipment, teat dips and detergents.
- Static and dynamic testing of milk parlours.
- Milk parlor troubleshooting.

Education

- Advice on laboratory facilities and laboratory examinations.
- Organisation of workshops for producers and for dairies.
- Publication of technical news letters.
- Promotion of research projects.
- Field studies.
- Advice, co-ordination, and follow up of all services provided.

Milk Quality

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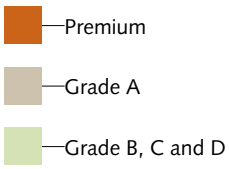
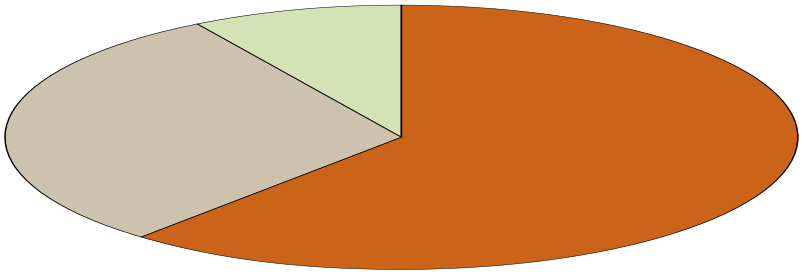
Fig. 2.2

Milk supply, by somatic cell count categories, in 2008





SOMATIC CELL COUNT		
Quality Grade	**Count per ml**	**% of supplied milk**
Premium	Less than 220,000	61.6
Grade A	220,001 – 280,000	29.9
Grades B, C and D	over 280,000	8.5
Total		100.0

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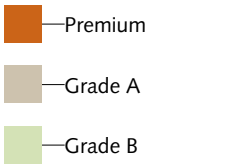
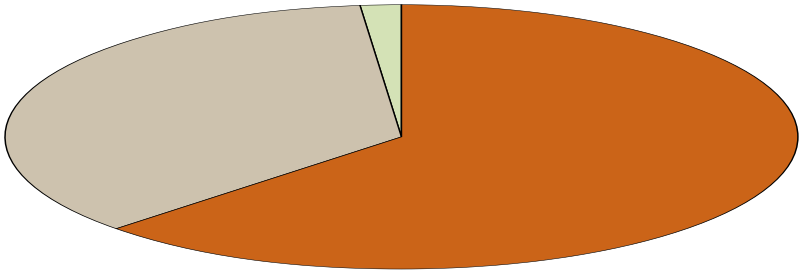
Fig. 2.3

Milk supply, by bacterial count categories, in 2008





BACTERIAL COUNT		
Quality Grade	**Count per ml**	**% of supplied milk**
Premium	Less than 10,000	62.9
Grade A	10,001 – 75,000	35.7
Grade B	over 75,000	1.4
Total		100.0

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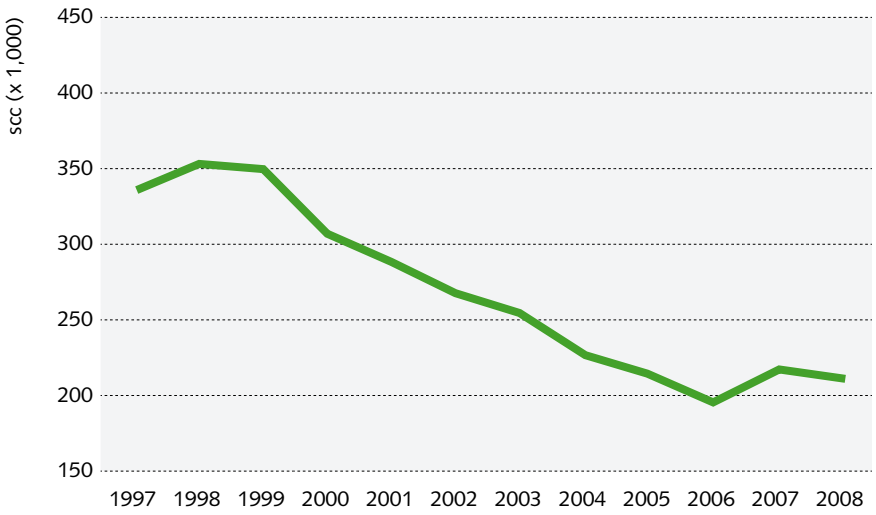
Fig. 2.4

Average somatic cell count, by year



A firm and constant policy was established by the Israeli Dairy Board in the 90s with the aim of improving milk quality. Economic incentives were set in order to lower the somatic cell count in the milk supplied to the industry and a threshold of price categories was progressively lowered along years. The farmers' response caused the average SCC (annual average for all farms) to decrease from 428,000/ml in 1995 to 211,000/ml in 2008 (data from milk processing plants).

The increase of the average SCC in 2007 is explained by the efforts to increase milk supply in order to attend the fast growing demand of milk products. Therefore, farmers kept in production cows that in normal times would have been culled out. In 2008 the average somatic cell count decreased once again.

Milk Marketing

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Every dairy in Israel does its own marketing and promotes its own brands. The IDB however, promotes only generic milk and generic milk products.

Consumption of milk products in Israel has distinct characteristics: most families are not accustomed to eating meat for dinner. Dinner, when eaten at home, is usually a dairy meal, while meat is consumed at lunch. Thus, milk products are usually eaten at breakfast and at dinner. Some of the reasons for this tradition are the Kosher precepts which determine that milk and meat are not eaten at the same meal.

The most popular cheese in Israel is a white spreadable cheese; its per-capita consumption is the highest in the world.
Although a great deal of dairy products are consumed by Israelis, children suffer from similar nutritional problems as those of the Western world: chronic shortage of calcium in the diet, and a growing obesity rate.

The IDB adopted the "three-a-day" philosophy as a leading concept, and the "three-a-day" logo appears on every IDB publication. "Three-a-day" will be the main message in the near future, as part of a long-term educational program. The concept has been promoted on the radio and in brochures, in meetings and in every IDB activity. During 2008 the IDB continued its extensive educational program in kindergartens called "Sida & Dan" (Sidan is Hebrew for calcium). As the name suggests, the programme deals with the importance of consuming milk and milk products three times a day as part of a balanced diet.

An educational project which started during 2007 and continued through 2008 was "The Milk Stage": Over 10,000 classes in elementary schools received a kit, including a challenging game to be played in class, a personal notebook with facts about healthy nutrition and tips on improving nutritional habits. This kit, put together by the IDB comprises a book telling the story of Sida & Dan, two imaginary characters that help strengthen bones, a memory game, colouring-in pages, stickers, letters to parents and several other activities, all dealing with health and nutrition The "Sida & Dan" kit was distributed free of charge to 9,500 kindergartens in Israel, including 2,000 kits adapted for the Arab sector, and 1,500 for the religious sector. Letters were sent to teachers several months after the kit was received, with additional nutritional information as well as games for the kids. Many of these activities are done together with the Ministry of Health and with the Ministry of Education, and they are meant to improve nutritional behavior of children and parents.

Pediatricians, gynecologists, gastroenterologists and dietitians were given a great deal of information about nutrition during 2008, including facts and figures about osteoporosis, the connection between eating dairy products and weight loss, and the importance of the "three-a-day" concept.

The year 2008 was the fifth year in which the IDB, together with all dairy farms in Israel, celebrated "The Joy of Milk" festival. In February, a month with very high milk yields, dairy farmers open their doors and invite visitors in to watch milking, feeding, handling and caring of the cows, sheep and goats

Annual Marketed Milk

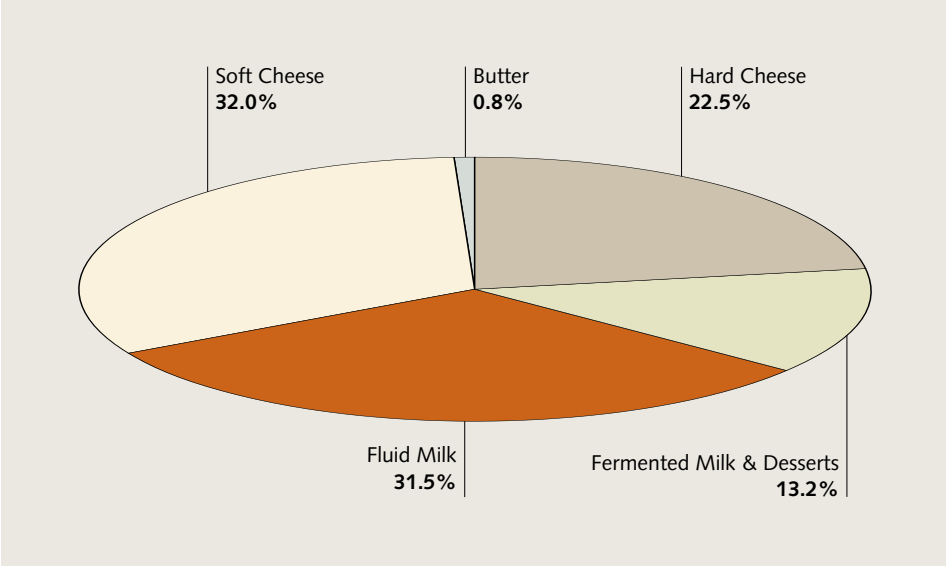
Year	Cow Milk					Sheep & Goat Milk		
	Fluid Milk	Fermented Milk and Desserts	Soft Cheese Ton	Hard Cheese Ton	Butter Ton	Soft Cheese Ton	Hard Cheese Ton	Yoghourt and others, Ton
2002	359,594	148,743	79,252	22,435	5,423	925	1,140	446
2003	359,859	147,151	79,900	22,547	5,444	1,040	1,131	776
2004	370,266	146,820	80,703	22,813	5,713	1,266	1,200	1,139
2005	378,957	151,766	82,359	23,528	5,816	1,273	1,236	1,387
2006	402,251	164,220	87,266	25,112	6,209	1,361	1,173	1,328
2007	405,928	166,610	88,177	26,472	6,175	1,703	1,096	1,780
2008	405,736	170,367	91,526	27,547	5,431	1,665	1,092	1,938

Table 2.5

Distribution of annual marketed milk, by dairy products. (tons)

Fig. 2.5

Distribution of annual marketed milk, by dairy products (% of total, based on skimmed milk equivalent)



Sheep and Goat Milk Production

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Table 2.3

Sheep and goat milk – Annual production

Year	Sheep milk (x 1000 ltrs.)	Goat milk (x 1000 ltrs.)
1997	9,021	2,581
1998	8,695	2,982
1999	8,716	2,940
2000	8,736	3,375
2001	9,758	3,579
2002	10,389	4,147
2003	9,931	5,142
2004	10,446	5,407
2005	11,527	6,171
2006	10,966	7,027
2007	9,877	7,928
2008	9,818	10,155

Raising sheep and goat for milk and meat is one of Israel's oldest agricultural branches. Today, approximately 2,500 families* raise sheep and goats under a wide range of production systems: from extensive, traditional, semi-nomadic, and transhumant flocks to the intensive, zero-grazing dairy and meat units of moshav and kibbutz farms in various parts of the country. The evolution of the Israeli sheep sector is a good example of how modern technology has been integrated into a traditional farming system through research and development.

Milk production

Some 11.0 million kg of sheep milk and 7.0 million kg of goat milk are produced annually. The milk is used for a diverse range of cheese and yogurt products. Due to their high quality and properties, sheep and goat cheeses are exported, mainly to the USA.

* sheep for meat included.

The Israel Cattle Breeders Association

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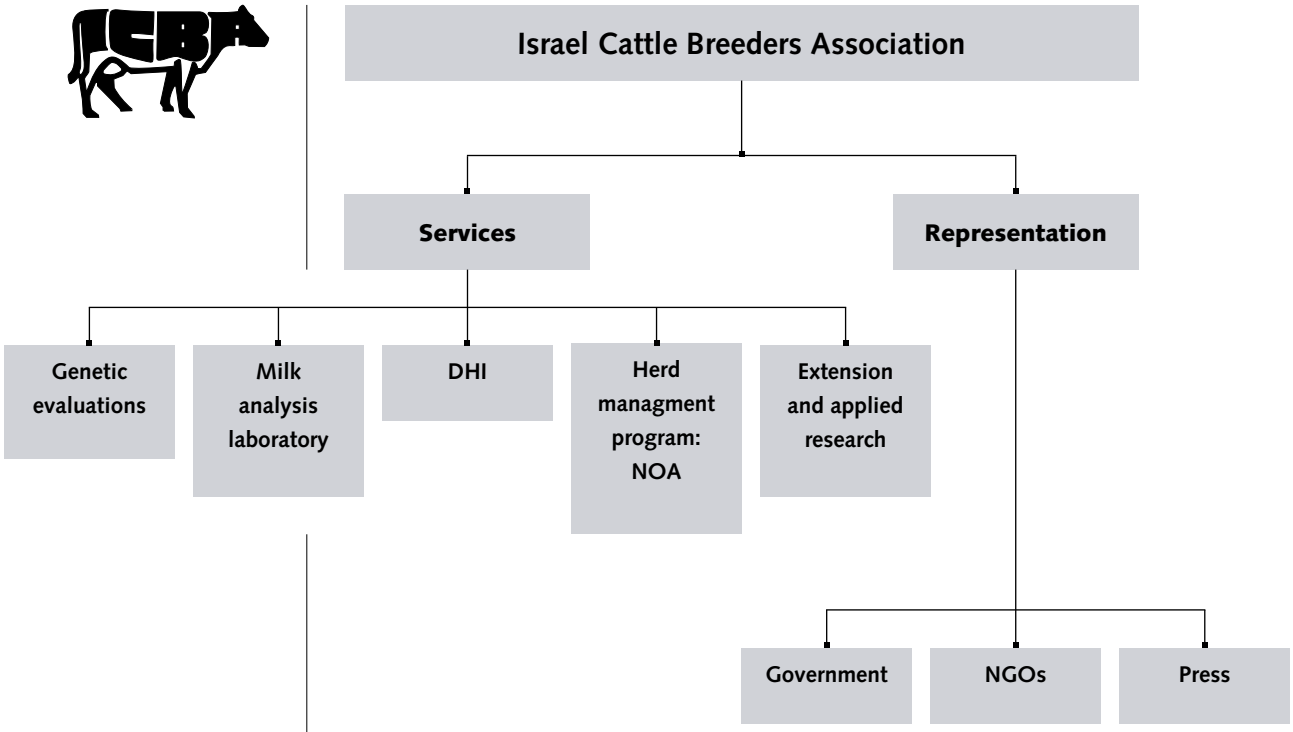

The Israel Cattle Breeders Association represents all dairy cattle farmers in Israel. For the past 80 years the organization has been the sole representative of all milk producers in the country, taking care of all their professional needs and sustaining a vibrant and modern industry.

The organization supplies essential assistance to its members and the satellite organizations connected to the industry. The pivot point of the organization is the National Herdbook, which is one of the most comprehensive herdbooks in the world.

The ICBA Database

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In 2008 the Israeli Dairy Herdbook collected information from 103,895 cows in 688 herds, 87% of the dairy cows in the country. The ICBA database gathers information and merges additional data from other related sources, and aims to integrate all relevant information regarding the Israeli dairy herd. This integrated database allows farmers, extension advisors, veterinarians, the Sion A.I. institute and others, access to controlled and accurate information. Sources and users of this system are listed below:

Input sources

- **DHI** – Milk recording is performed by two methods. In herds with > 150 cows (70% of the cows), recording is done monthly by an ICBA representative (A4 method), who records the relevant information on a hand-held terminal. On the remaining 30% of cows, the farmer manually records milk yield (B4 method) and sends the information to the central computer. For all milk-recorded cows, a monthly sample of milk is sent to the Central Milk Laboratory.

- **Central milk laboratory** – This laboratory, presently equipped with three FOSS analyze-instruments, analyzes milk components (fat, protein, lactose, SCC, MUN and casein rate) in the DHI milk samples. This laboratory also analyzes milk samples from daily shipments to the dairies. These results are used to determine payment for farmers.

- **A.I. technicians** – Technicians of the Sion A.I. cooperative services inseminate 98% of the cows in Israel. All cows from the herds included in the DHI system have bar-coded insemination cards containing information on the cows and their pedigree. Before selecting a semen straw, the technician checks bloodlines of the cow and candidate sires, using a hand-held terminal. Inseminations are performed only if inbreeding coefficient is under 3.125%. Details of the inseminations are transferred to the ICBA database, via the terminals.

- **National Service for Udder Health and Milk Quality** – The "Udder Health" database is located on the Israel Dairy Board server, and is regularly updated with information on all cows included in the DHI system. Bacterial cultures are matched to other information of the cow; including days in milk, SCC, milk yields, milking status, and calving dates. Results are sent to the farmer and the veterinarian, and merged into the ICBA database.

- **Processing plants** – Samples of all milk supplied to dairy processing plants in Israel is assayed for fat, protein, lactose, and SCC. For each shipment, the dairies send the farmer a summary including the milk quantity shipped, fat and protein content, and SCC of the milk. This information is transferred to the ICBA database. Once a month the dairies send each farmer and the ICBA a summary of marketed milk volume and payment details.

- **Interbull** – Every three months a file of genetic evaluations of all recorded bulls in the participating countries is forwarded by Interbull. Information of bulls whose semen has been imported to Israel, but do not have local evaluations, is updated automatically at the central computer, and this information is distributed electronically to the farmers.

- **Farms** – Approximately 80% of the cows registered on the DHI are located at farms that use a management computer program. About 90% of those farms use the "NOA" program that was developed and is maintained by the ICBA. The farmer enters data on calvings, cows that are "dried off", new acquisitions, culled cows, veterinary pregnancy check results, diagnostic codes, veterinary treatments, etc. Once a month all information is transferred to the Herdbook database, and a series of logical checks is applied to correct mistakes. Farmers that do not use a computer management program send paper reports that are manually entered into the central database.

Reports

Genetic evaluations of bulls and cows are computed bi-annually in conjunction with the Department of Genetics of the Institute of Animal Sciences of the Agricultural Research Organization. Results are distributed to the farmers, forwarded to Interbull, and published on the ICBA Hebrew Internet site (www.icba.org.il) that includes an FTP server. Files including data on cow birth, calving and culling dates, milk yields and laboratory results are sent to the "Udder Health" laboratory. Files including data on cow birth, calving and culling dates, results of pregnancy checks and genetic evaluations, including the Interbull evaluations are sent to Sion A.I. company. Milk recording results, records of the milk shipments to the dairies, results of bacterial analyses from the "Udder Health" laboratories, and genetic evaluations, including the Interbull evaluations, are sent to the dairy farms. Monthly summaries are forwarded to the Ministry of Agriculture extension advisors, feed centers, and regional dairy farmers associations. Files including milk recording results, diagnostic codes, and treatments are sent to the "HaChaklait" veterinary cooperative.

Summary

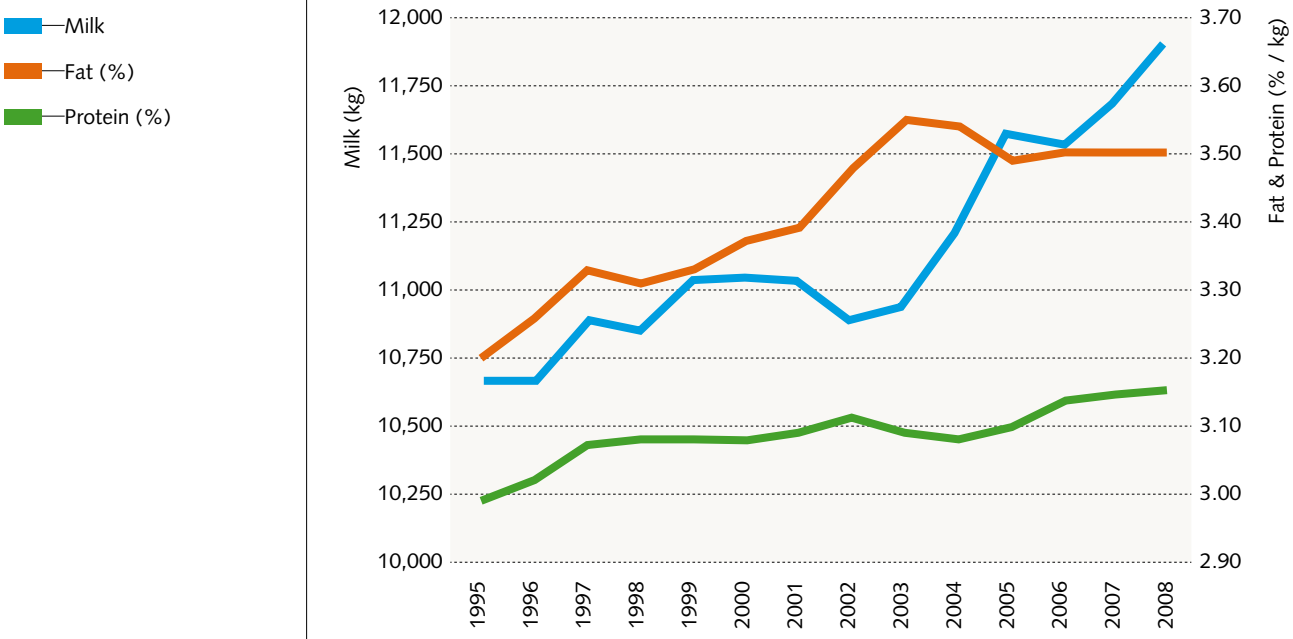
The Israel Cattle Breeders Association database is the hub for all information on dairy farming in Israel. All data are subject to logical checks, so that the dairy farmer and other end-users receive accurate and reliable information. The intensive computer application in Israeli dairy farming enables all of the entities involved to access the large database at a relatively low cost.

Table 3.1 & Fig. 3.1

Production averages of Israeli-Holstein cows, by calving year

305-day adjusted lactations (1-5)

Calving year	No. of cows	Milk, kg	Fat, %	Protein, %	Fat (Kg)	Protein (Kg)
1995	83,696	10,665	3.20	2.99	341	319
1996	81,477	10,665	3.26	3.02	348	322
1997	81,507	10,887	3.33	3.07	363	334
1998	82,004	10,850	3.31	3.08	359	334
1999	81,742	11,029	3.33	3.08	367	340
2000	81,622	11,048	3.37	3.08	372	340
2001	80,787	11,031	3.39	3.09	374	341
2002	86,554	10,890	3.48	3.11	379	339
2003	84,696	10,938	3.55	3.09	388	338
2004	84,694	11,200	3.54	3.08	396	345
2005	83,456	11,565	3.49	3.10	404	359
2006	77,334	11,506	3.52	3.14	405	361
2007	80,874	11,687	3.52	3.15	411	368
2008	88,147	11,903	3.52	3.16	419	376



Due to a policy which encouraged the production of milk rich with protein and fat there was an increase in their quantity over the years. The average fat content during 2008 was 3.71% (data from milk plants). The rise in fat content in raw milk is opposite to the decline in average fat content in consumption, for the consumers preference is low-fat milk products. Thus arose a need to suppress the growth in fat content. Starting August 2005 a policy of lower payment per fat above a specific level every year (in 2008 the level was 3.779%) caused a decline in fat content.

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Table 3.2

Production averages in 2008, by parity number

	1st lactation cows	2nd lactation cows	Adult cows	Total
Complete lactations				
No.	27,102	18,364	27,042	72,508
Milk yield, kg	11,406	13,295	13,817	12,782
ECM* yield, kg	11,605	13,391	13,616	12,806
Fat yield, kg	423	483	489	463
Fat, %	3.71	3.63	3.54	3.62
Protein yield, kg	372	429	434	410
Protein, %	3.26	3.23	3.14	3.2
Adjusted 305-d lactations				
No.	25,948	17,669	25,907	69,524
305-d adjusted ECM, kg	11,629	11,995	11,874	11,813
Days in milk	361	358	356	358
Milk yield, kg/day in milk	31.6	37.1	38.8	35.7
Feed days	423	421	420	421
ECM yield, kg/cow in herd-day	27.4	31.8	32.4	30.4
Dry period, days	61	62	62	62
Days open	147	145	144	145
Calvings				
Total No. of calvings	32,817	26,323	44,606	103,746
Calves born	33,122	27,459	47,868	108,449
Age at calving, months	24	38	67	46
Normal calvings	28,912	24,801	42,099	95,812
Normal calvings, %	88.1	94.2	94.4	92.4
Premature calvings	702	548	939	2189
Premature calvings, %	2.1	2.1	2.1	2.1
Abortions, %	11.9	11.3	10.5	11.1
Stillborn calves, %	8	5.9	7	7

* ECM = Economic Corrected Milk, according to the formula for milk payment :
up to 3.779% Milk Fat: 0.1 * kg Milk + 7.67 * kg Fat + 20.21 * kg Protein over 3.779% Milk Fat,
the index for kg Fat is 3.56

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Table 3.3

20 cooperative herds with highest average annual milk yield per cow (3x milkings) in 2008

No.	Herd	ECM kg	Milk kg	Fat %	Protein %	F+P kg	SCC x1000	No. of cows in herd
1	Carmiya	14,213	13,888	3.71	3.19	957	225	375
2	Habonim	13,822	13,480	3.60	3.25	921	220	244
3	Sa'ad	13,744	13,155	3.64	3.32	915	197	312
4	Nachal Oz	13,713	13,332	3.68	3.23	920	128	329
5	Maccabi-Hanaton	13,505	13,255	3.60	3.21	902	158	485
6	Shutfut Ran	13,470	13,131	3.61	3.24	899	130	970
7	Tze'elim	13,430	13,100	3.64	3.23	899	159	290
8	Be'Rishtenu	13,416	13,479	3.46	3.15	889	223	319
9	Yavne	13,404	13,096	3.67	3.21	899	151	407
10	Ginosar	13,339	13,274	3.59	3.15	893	177	272
11	Heftzibah	13,111	13,003	3.50	3.20	870	177	276
12	Refet Galil Ma'aravi	13,077	12,601	3.72	3.26	879	165	845
13	Ma'ale Gilboa	13,053	13,088	3.53	3.13	871	189	266
14	Mefalsim	13,047	13,121	3.40	3.17	860	215	308
15	Carmel Ma'on	13,005	12,644	3.57	3.27	864	208	437
16	Alumim	13,003	12,456	3.77	3.27	876	207	313
17	Refet Manor	12,909	12,707	3.59	3.20	862	182	561
18	Refet HaTabor	12,897	12,747	3.57	3.19	860	210	558
19	Kfar Masarik	12,881	12,710	3.59	3.19	860	187	264
20	Nitzanim	12,869	12,634	3.62	3.20	861	188	331

Table 3.4

20 Family herds with highest average annual milk yield per cow (2x + 3x milkings) in 2008

No.	Village	Herd	ECM kg	Milk kg	Fat %	Protein %	F+P kg	SCC x1000	No. of cows in herd
1	Kanaf	Koren Farm	13,847	13,811	3.59	3.13	928	109	36
2	Shfeyia Ag. School	Shfeyia Ag. School	13,622	13,275	3.71	3.20	917	177	80
3	Hayogev	Ben Tzvi Farm	13,088	12,335	3.72	3.38	874	140	60
4	Amatz	Israel Reuven Farm	12,997	12,535	3.69	3.27	871	218	107
5	Tzipori	Michaeli Farm	12,925	12,839	3.58	3.16	864	124	53
6	Givat Yo'av	Golani Farm	12,912	12,860	3.62	3.13	867	184	57
7	Givat Yo'av	Levin Farm	12,894	13,003	3.42	3.14	853	148	53
8	Kfar Haro'eh	Peleg Farm	12,886	12,435	3.65	3.27	861	107	96
9	Tzipori	Shmueli Bros. Farm	12,847	12,566	3.69	3.20	864	119	124
10	Neot Golan	Cohen Farm	12,845	12,767	3.61	3.15	861	183	44
11	Sde Ya'akov	Baranawski Farm	12,805	12,492	3.53	3.27	848	195	137
12	Nir Israel	Fodor Farm	12,791	12,600	3.51	3.22	848	184	197
13	Yokne'am	Strauss Farm	12,788	12,559	3.65	3.19	858	171	122
14	Givat Yo'av	Efrat Farm	12,765	12,552	3.63	3.19	855	67	49
15	Amatz	Sahar Farm	12,762	12,330	3.63	3.28	851	249	78
16	Ramat Tzvi	Landau Farm	12,708	12,726	3.46	3.16	842	180	68
17	Be'er Tuvia	H.B.Sh. Farm	12,661	12,519	3.64	3.16	850	157	102
18	Peduyim	Hason Farm	12,630	12,709	3.39	3.17	832	92	79
19	Givat Yo'av	Sofer Farm	12,598	12,726	3.49	3.11	839	238	37
20	Be'er Tuvia	Katz Farm	12,585	12,138	3.77	3.23	850	156	70

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Table 3.5

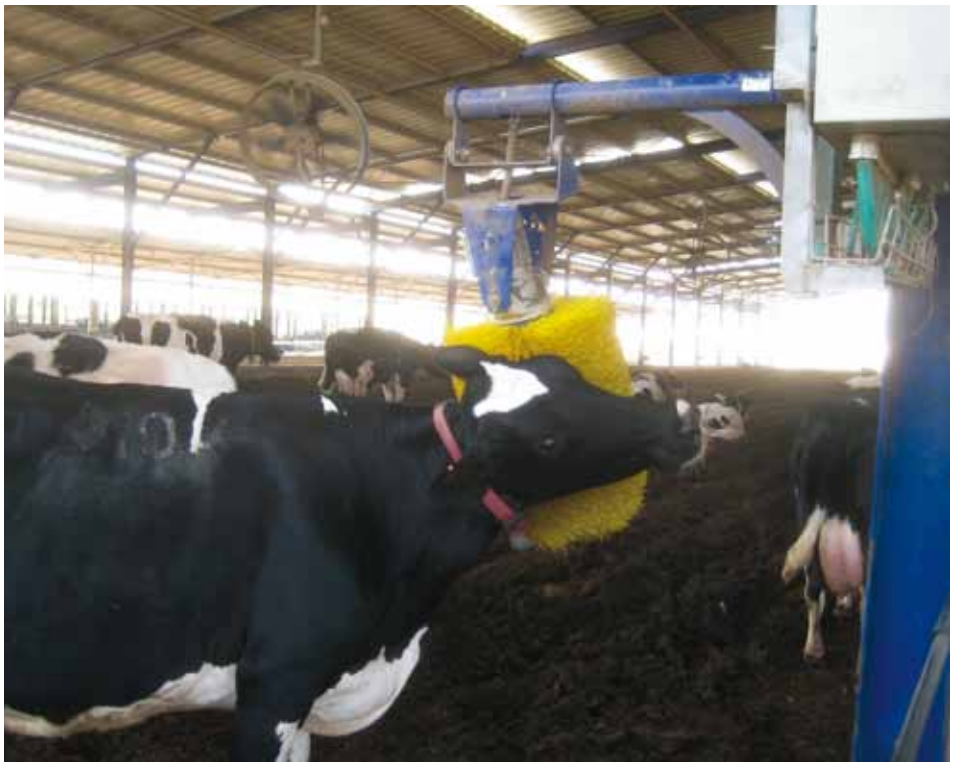
20 cows with highest adjusted ECM yield in 2008

No.	Herd	Cow No.	Sire	Lact. No.	Milk kg	Fat %	Protein %	ECM kg
1	Shutfut Ran	3834	Gad	3	17,769	3.71	3.35	18,492
2	Alumim	724	Dachev	2	18,638	3.43	3.14	18,279
3	Nahal Oz	4909	Vogui	3	18,795	3.52	3.04	18,172
4	Shutfut Ran	6644	Avsha	1	18,285	3.49	3.18	18,137
5	Alumim	599	Merrill-Lynch	3	19,814	3.01	2.97	18,112
6	Carmiya	6278	Avsha	2	19,246	3.46	2.93	18,089
7	Carmiya	5936	Sus	4	17,598	3.90	3.24	18,070
8	Shutfut Maccabi-Hanaton	5680	Avsha	3	17,826	3.63	3.23	18,053
9	Alumim	469	Sus	4	19,209	3.14	3.04	18,030
10	Shutfut Ran	1094	Moach	2	17,931	3.68	3.16	17,997
11	Carmiya	6144	Avsha	3	19,220	3.48	2.90	17,983
12	Shutfut Ran	6596	Avsha	2	16,908	3.88	3.42	17,944
13	Shutfut Ran	6366	Rogy	2	17,589	3.79	3.22	17,915
14	Migdal Oz	6234	Roliez	4	18,302	3.30	3.16	17,825
15	Shutfut Ran	6642	Marcie	2	16,105	4.27	3.58	17,819
16	Yad Hail	7933	Avsha	2	17,716	3.61	3.20	17,817
17	Shutfut Maccabi-Hanaton	5877	Avsha	2	17,373	3.96	3.21	17,747
18	Shutfut Ran	5647	Roliez	4	17,005	3.78	3.34	17,724
19	Ginosar	6608	Avsha	3	18,802	3.54	2.90	17,707
20	Hof HaSharon	8500	Aise	3	16,142	3.99	3.58	17,704

No.	Herd	Cow No.	Sire	Lact. No.	Days in milk	Milk kg	Average milk yield kg/day	Fat %	Protein %	Culling date
1	Ma'ale Gilboa	6492	Lasso	13	5,085	200,538	40.0	3.27	2.87	
2	Maoz Hayim	4616	Ginat	13	4,382	183,797	42.6	3.34	2.81	
3	Ma'ale Gilboa	6817	Boteach	9	4,249	167,113	40.1	3.33	3.15	
4	Shluchot	4131	Bosna	14	4,411	161,252	41.5	3.43	2.83	26/7/2007
5	Refet Tefen-Tuval	998	Bum	11	3,887	160,687	41.9	3.46	3.02	10/9/2007
6	Strashnov Farm	295	Tamim	11	3,872	157,786	41.3	2.83	2.74	
7	Efrat Farm	4132	Boteach	12	3,811	157,239	37.6	3.25	2.87	
8	Yavneh	504	Boteach	12	4,011	154,994	41.7	3.65	3.05	
9	Sa'ad	4061	Scorer	9	3,304	150,901	47.6	3.61	3.05	21/6/2007
10	Israeli Farm	963	Unknown	12	3,714	149,734	41.9	3.10	3.08	
11	Gezer	2312	Scorer	10	3,477	148,646	37.4	3.09	2.86	20/6/2007
12	Sa'ad	4180	Scorer	8	2,997	146,979	43.6	3.18	2.98	
13	Refet Tzfon Hagolan	359	Boteach	8	3,962	145,431	41.3	3.70	3.04	
14	Refet HaTabor	4889	Scorer	11	3,415	145,086	37.3	3.27	3.04	6/4/2007
15	Ein Tzurim	4685	Scorer	9	3,170	144,787	37.7	2.86	2.79	21/11/2007
16	Ma'ale Gilboa	7131	Sport	10	3,363	144,631	38.6	3.59	3.24	
17	Refet Darom	3586	Flor	10	3,620	143,050	39.9	3.14	3.00	8/1/2007
18	Carmel Ma'on	6450	Saf	11	3,773	142,838	44.8	2.89	2.98	
19	Beit Sefer Kfar Galim	729	Chalutz	11	4,063	142,643	40.1	3.75	3.06	
20	Revadim	3733	Doren	10	3,219	141,505	39.2	3.29	2.84	10/1/2007

Table 3.6

20 cows with highest lifetime yield, producing in 2008



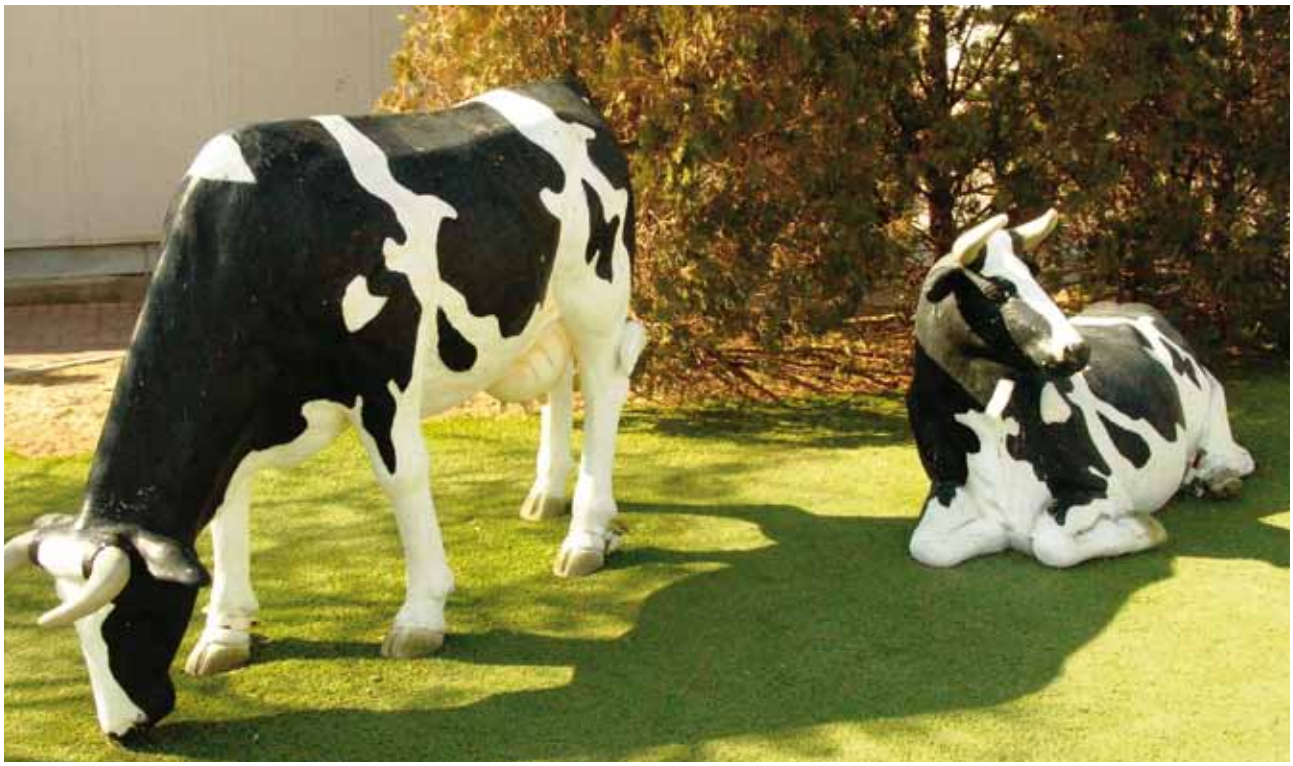
NOA – The Israeli Dairy Herd Management Program

Boaz Hanochi____Product Manager of NOA Software, ICBA ▸ hmb-hboaz@icba.org.il

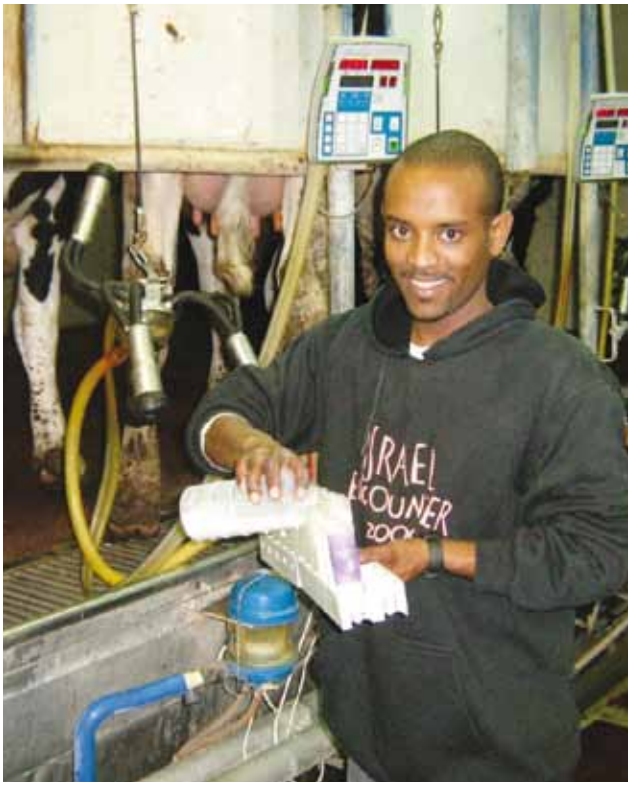
NOA is a comprehensive program for dairy herd management which was developed by the Israeli Cattle Breeders Association (ICBA). NOA addresses all aspects of dairy farming. NOA has been designed to give the herd manager up-dated information regarding all aspects of dairy activity.

Major features of NOA

- **Herd management** – Updating of lactation, production and reproduction events. Cows entry (acquisition), culling and moving between groups within the herd. Veterinary data: input of diagnosis, treatments, medications and automatic synchronization protocols.
- **Feeding** – Linear programming and ration composition, feed production and TMR planning, stock management and stock reports. Communication with feeding controllers. Complete tracking and monitoring of feed consumption.
- **Milk production** – Milk marketing updating, milk recording and summary reports including lactation summaries. Communication with different brands and types of commercial milk-meters (on-line milk data).
- **Reproduction** – All the Herdbook reproduction parameters are available in NOA. Simple predesigned reports give a reliable updated picture of the reproduction status and trends to the dairy farmer. Numerous reproduction indicators are calculated: days open, pregnancy rate, heat detection rate, conception rate, waste days, etc.
- **Genetic management** – Graphical presentation of cows and bulls pedigree data. Mating program is implemented to optimize the breeding value progress of the herd and to minimize the risk of inbreeding. Simple tools to implement breeding program according to particular herd goals.



- **Quota production planning** – Special interactive module for better managing of the milk quota production along the year. Simulation of the herd milk production on a monthly level, with a sophisticated prediction algorithm. The prediction is based on the herd performance in the last 2 years.
- **Lactation curve analysis** – Special report for analyzing the periodic lactation curve of the entire milking cows. Seasonal production is also analyzed and the effectiveness of the cooling system can be evaluated by this report. Graphic presentation of the lactation curve is provided for each lactation number separately. Production level ratio of first lactation cows to second and third lactation cows is calculated.
- **Economic module** – New module that was released in the 2008 version gives the farmer the opportunity to record all the financial transactions including delivery notes and invoices. Dynamic profit and loss report can be easily derived. This module gives the dairy farmer an efficient tool for better controlling current management.
- **Additional features** – Shared database (network), powerful report generator, PDA application for pocket pc (IPAQ-HP) that includes all cows' data.



NOA coordinates import and export of files to the national Herdbook database, dairy processing plants, central milk laboratory, livestock insurance companies, "Udder Health" laboratory, feed mills, and others.

NOA uses a Windows user interface and is user-friendly, despite its complexity and sophistication. The program was developed by top Israeli dairy herd professionals in order to meet the needs of both small and large dairy enterprises.

NOA was introduced in Israel in April, 2000. Today, nearly 600 dairy farms use the program, including 98% percent of all dairy farms with over 250 dairy cows.

Each month new dairy farms install the program and the total number of cows which are managed under NOA software in Israel is nearly 80,000.

NOA interfaces with all aspects of dairy production control, including milking robots and feeding controllers.

For the first time, comprehensive dairy farm management is possible with a single integrative and user-friendly program.

The program is maintained by an ICBA professional team that includes experienced field advisers, phone support for software users and programmers. Communication between the dairy farm computer and the national Herdbook database is carried out via an Internet website maintained by ICBA. Numerous dairy farmers and entities in the dairy industry are connected via the "Milk net", which facilitates two-way interactive exchanges and provides E-mail, a bulletin board and other services.

International cooperation – ICBA cooperate with DeLaval Company globally. In the coming year's dairy farmers around the world will be able to utilize many of the features of NOA system.

The Israeli Selection Index

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Dr. Joel I. Weller____ Institute of Animal Sciences, Dept. of Genetics, A.R.O. ▸ weller@agri.huji.ac.il

The Israeli breeding program is monitored by the Israeli Breeding and Herdbook Committee, which includes representatives of the Sion A.I. Company, the Israeli Cattle Breeders Association, and scientists of the Department of Genetics of the Institute of Animal Sciences of the Agricultural Research Organization.

PD07 – THE ISRAELI BREEDING INDEX

Index coefficients for Milk, Fat, and Protein were computed to maximize expected farmer profit. Profit was computed as income, less cost of feed required to produce the three milk components, transportation costs for fluid milk, and the fixed costs per cow, which were set so that the net profit would equal zero. The index coefficients were computed by differentiating the profit equation with respect to each component. The index coefficients were normalized so that one standard kg of milk with 3.50% Fat and 3.13% Protein, would have a unit value. The index coefficient for somatic cell score (SCS) was computed so that expected changes for SCC would be close to zero. The index coefficients for daughters' fertility, herdlife, persistency, dystocia, and calf mortality were computed to account for the economic value of those traits relative to milk production. The current Index PD07 was updated in December 2006 and is as follows:

PD07 = 6.3 (kg Fat) + 25.4 (kg Protein) – 300 (SCS) + 26 (% Daughters' Fertility) + 0.6 (Days Herdlife) + 10% (% Persistency) – 3 (% Dystocia) – 6 (% Calf mortality)

Expected genetic gains after ten years of selection using this index are: 725 kg milk, 26.5 kg fat, 26.5 kg protein, - 0.14 SCS, 1.7 % daughters' fertility, 150 days herdlife, 2.4 % persistency, -1.2 % dystocia, and -1.0 % calf mortality.

Genetic evaluations for milk, fat and protein production, SCS, daughters' fertility and persistency are calculated by the multitrait animal model, using parities 1 to 5, with each parity considered as a separate trait. Herdlife is calculated by a single trait animal model. "Persistency" is persistency of milk production. Dystocia and calf mortality refer to the effect of the cow calving and include only first parity records. Dystocia and calf mortality are calculated by sire and maternal grandsire models. The base for all genetic evaluations is the mean breeding value for cows born in 2000.

Israeli Breeding in 2008

Dr. Yoel Zeron____Director of Science and Production, Sion A.I. Company ► yoel@sion-israel.com

In general, 2008 was characterized by a change in the milk-quantity demand by the dairy industry in Israel. During the first six months of the year most of the dairy farms exceeded their production quota, while the opposite was true during the second half of the year. On an annual basis, results were within the limits of set quotas.

The large number of inseminations was in direct correlation with the large quantity of cows per herd. There was an increase in the culling rate towards the end of the year. The Israeli dairy farmer continued to rely on local proven bulls and the number of inseminations performed with imported semen was slightly lower than those of 2007 (Table 1).

Table 1
Number of inseminations performed with imported semen, by breed, during the past two years

BREED	No. of Doses		% of Total No. of Inseminations	
	2007	2008	2007	2008
Holstein	10,150	7,921	2.9	2.1
Charolais	6,196	6,329	1.8	1.7
Belgian Blue	4,131	3,357	1.2	0.9
NRF	3,064	4,968	0.9	1.3
Other breeds	1,115	618	0.3	0.2
Total	24,656	15,890	7.1	6.2

Inseminations

The number of inseminations at SION has reached a total of 375,000, signifying an increase of approximately 6.5% compared to the number registered in 2007. There was a 12.6% decline in the use of imported semen between 2008 and 2007, mainly due to a decrease in the demand for beef-cattle semen. The number of imported Holstein semen doses declined as well. In contrast, the use of NRF in 2008 increased slightly and reached 1.3% of the total number of inseminations. The imported semen is used primarily for the heifer population.

Laboratory and Semen Production

Approximately 200 bulls are kept at SION's main site. Each year, SION tests 50 new young bulls. The majority of the bulls mount twice a week, but those in high demand, or those for which a semen bank of 40,000 straws is being prepared (30% of each new young group), can mount as often as four times a week. In 2008, the total production of SION's laboratory reached approximately 1,233,000 doses, with an average of 365 mountings with effective ejaculation per month. The group of mounting bulls primarily comprises bulls aged up to 2.5 years (young and tested bulls), that produce an average of 250 doses per mount. Thus, an average of 160 mounts is required to produce the 40,000 doses stored in the semen bank per bull, a process that takes about a year and a half to complete.

Seasonally effect on bulls' sperm

During the summer the Temperature Humidity Index (THI) is very high and might affect the bulls' ability to deliver semen of appropriate quality. A study was conducted to evaluate the volume, concentration, motility and progressive motility, live/dead cells, acrosome viability, ion channels, lipid membrane composition, gene expression and fertility, both in-vitro and in-vivo between semen that was produced during summer (July – August) or winter (December - February). Results demonstrated that there was a difference in ion channels, lipid membrane composition, gene expression and progressive motility between summer and winter. Regarding in-vivo fertility no significant difference was noted. These results show that semen that is approved by laboratory evaluation is equally qualified for inseminations during both winter and summer.

Genomics

SION supplied about 860 samples of sperm from bulls that were tested and proven in Israel to participate in a study on genomic applicability. The samples were scanned onto the Illumina Bovine SNP50 chip. Researchers at the Volcanic Institute and the Technion (Israel Institute of Technology) are currently working to preparing SION's young bulls to be applicable for the breeding program by means of the genomic technique.

Table 3.7

Average Breeding Value of cows, by birth year – Genetic Trends

Birth Year	Milk kg	Fat kg	Fat %	Protein kg	Protein %	SCS	Daughters' Fertility	Productive Longevity	Calf Mortality	Calving Diff.	Lactation Persist. %	PD07 kg
1987	-680	-33.6	-0.09	-34.2	-0.13	0.03	-0.58	-217	-0.45	-0.14	-3.34	-1264
1988	-546	-32.9	-0.13	-32.0	-0.14	0.10	-0.48	-193	-0.60	-0.65	-2.67	-1198
1989	-426	-31.3	-0.15	-29.6	-0.15	0.13	-0.52	-167	-0.44	-0.54	-2.21	-1121
1990	-290	-28.1	-0.17	-28.1	-0.18	0.12	-0.55	-145	0.00	0.00	-2.13	-1048
1991	-230	-23.1	-0.14	-24.2	-0.16	0.14	-0.22	-133	0.76	0.80	-1.84	-913
1992	-150	-18.2	-0.12	-20.0	-0.14	0.17	0.24	-92	1.41	1.54	-1.64	-751
1993	-125	-17.1	-0.12	-18.0	-0.13	0.25	-0.10	-95	1.35	1.31	-0.94	-721
1994	-128	-15.8	-0.10	-15.2	-0.10	0.22	-0.57	-89	1.60	1.49	-0.72	-641
1995	-164	-12.9	-0.06	-14.0	-0.08	0.19	-0.31	-82	1.33	1.24	-0.93	-572
1996	-91	-10.7	-0.07	-10.7	-0.07	0.13	-0.10	-51	1.37	1.29	-0.43	-427
1997	-71	-6.9	-0.04	-8.3	-0.05	0.09	0.26	-31	1.12	1.02	-0.64	-307
1998	-52	-6.4	-0.04	-5.7	-0.04	0.06	0.78	-4	1.21	1.09	-0.31	-198
1999	-23	-4.0	-0.03	-3.4	-0.02	0.01	0.28	-5	1.10	1.40	-0.24	-122
2000	0	0.0	0.00	0.0	0.00	0.00	0.00	0	1.06	1.46	0.00	-11
2001	62	2.9	0.01	2.8	0.01	0.02	-0.30	17	0.82	1.45	0.53	84
2002	92	4.7	0.02	3.7	0.01	0.01	0.41	37	0.49	1.76	0.51	150
2003	128	8.4	0.04	6.2	0.02	-0.03	0.69	43	0.18	1.70	0.44	260
2004	83	13.0	0.10	7.6	0.05	-0.08	0.62	41	-0.02	1.88	0.60	340
2005	139	16.4	0.11	10.4	0.06	-0.13	1.56	86	0.00	2.46	0.64	498
2006	167	15.7	0.09	12.1	0.06	-0.13	1.94	98	0.04	2.36	0.88	555

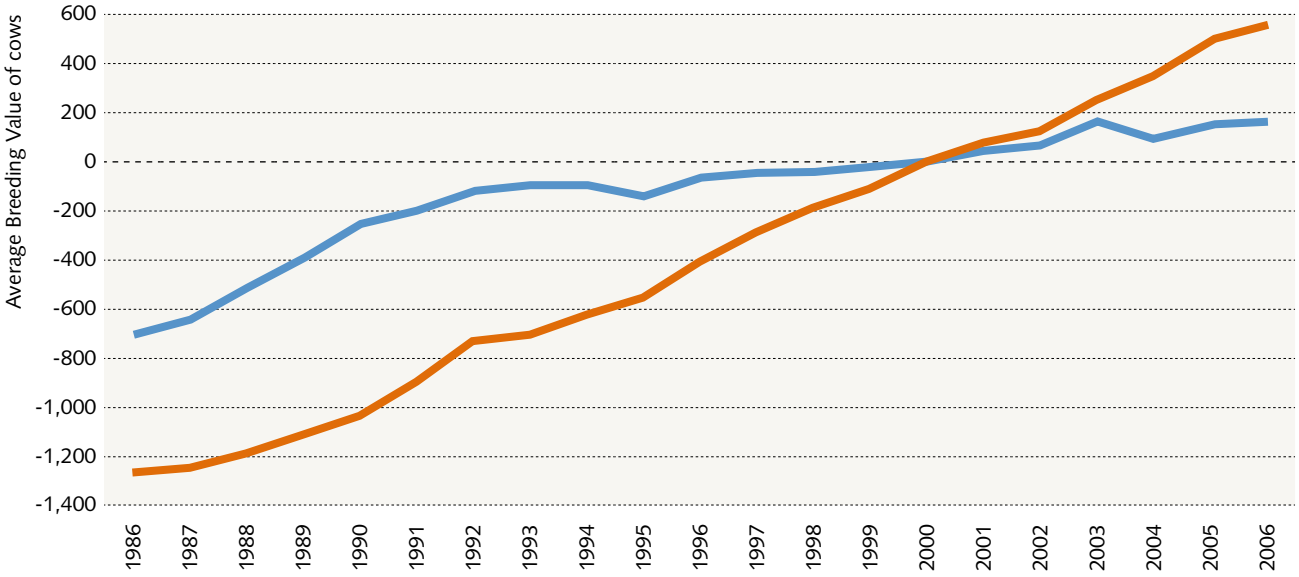

Fig. 3.2

Average Breeding Value of cows for PD07 and Milk, by birth year – Genetic Trends

Milk

PD07

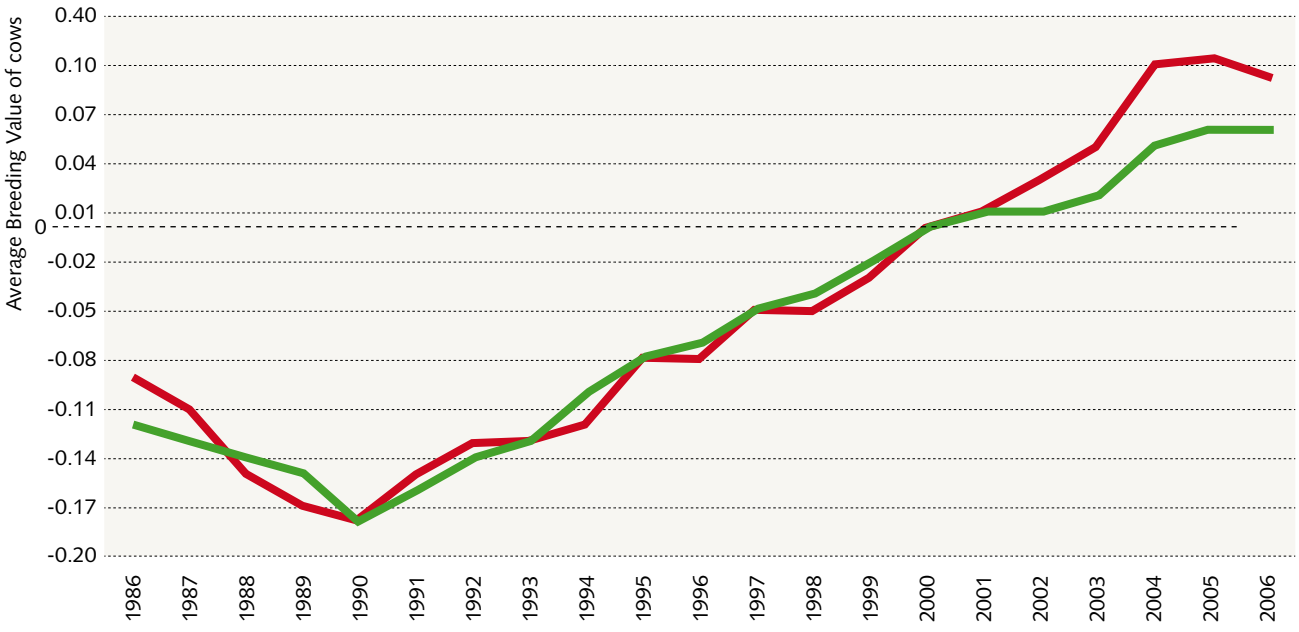

Fig. 3.3

Average Breeding Value of cows for Fat and Protein percentages, by birth year – Genetic Trends

Fat %

Protein %

Table 3.8

Average Breeding Value of bulls, by birth year

Birth year	Number of bulls	Milk kg	Fat kg	Fat %	Protein kg	Protein %	SCS	Daughters' Fertility	Productive Longevity	PD07
1985	39	-394	-14.4	-0.00	-18.4	-0.06	0.07	-0.06	-136	-683
1986	31	-308	-13.9	-0.03	-16.2	-0.06	0.16	-0.32	-120	-652
1987	38	-263	-14.4	-0.05	-12.6	-0.04	0.16	-0.16	-106	-547
1988	49	-188	-10.4	-0.03	-12.0	-0.06	0.04	-0.58	-89	-477
1989	33	-115	-7.7	-0.03	-11.0	-0.07	0.04	0.03	-72	-412
1990	32	-149	-8.8	-0.03	-11.2	-0.06	0.03	0.57	-79	-413
1991	41	-28	-6.9	-0.05	-5.5	-0.04	0.14	-0.17	-66	-293
1992	42	-191	-5.7	0.01	-6.6	-0.01	0.13	-0.72	-78	-341
1993	53	-226	-8.0	0.00	-8.1	-0.01	0.13	-0.02	-52	-352
1994	46	-129	-5.4	-0.01	-4.7	-0.01	0.08	-1.06	-63	-271
1995	38	-40	2.6	0.04	-0.5	0.01	0.09	-0.64	-44	-88
1996	53	-146	-1.2	0.04	-2.5	0.02	0.13	-1.02	-55	-192
1997	30	-125	0.4	0.05	0.6	0.04	-0.03	0.27	-24	3
1998	58	34	4.9	0.04	5.2	0.04	0.04	-0.86	-22	102
1999	21	-28	-0.3	0.01	1.7	0.03	0.05	0.06	-11	3
2000	28	-75	3.8	0.06	3.2	0.05	-0.04	-0.04	-20	83
2001	44	135	5.0	0.00	6.0	0.02	0.10	-0.09	4	143
2002	55	84	9.9	0.07	6.0	0.03	-0.03	-0.12	-2	201
2003	45	17	12.5	0.11	6.4	0.05	-0.10	-0.09	29	257
2004	26	-60	6.0	0.08	6.0	0.07	-0.04	0.90	31	236

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Table 3.9

Bulls that performed largest number of inseminations (all years)

Bull No.	Bull name	Sire	No. of inseminations
3274	Scorer	Thonyma Secret	199,301
829	Gyus	Oren	198,997
2132	Gaby	Arlinda Jet Stream	181,527
783	Pirchach	Hason	160,375
3651	Avsha	Sea-Mist Bell Extra	150,631
3212	Sinbad	Sunran Sundacer	145,711
2124	Shoeg	Shofet	128,094
7053	Aise	Avsha	121,938
787	Amir	Icar	119,631
3258	Shenef	Pony	115,990
2357	Flor	E-Z-Acres Starlite Bachelor	114,112
3241	Teva	Kingstead Valiant Tab	111,922
3089	Pitspon	Gyus	111,182
3123	Tamim	Crescent Mead Chief Stewart	110,645
3811	Sofon	Sccorer	110,273
3080	Pirate	Sabal	110,058
2122	Shats	Shofet	110,046
3304	Goopi	Goliat	108,771
7060	Badon	Ricecrest Brett	105,100
2176	Genosar	Gyus	103,848

Fertility Statistics

Information on insemination and pregnancy checks enable a thorough analysis of fertility performance at national and herd level. Reports are issued to farmers and are the basis for practical decisions regarding fertility management.
Data is presented as average results by parity categories.

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Table 3.10 & Fig. 3.4

Average Conception Rate at 1st service, for Heifers, 1st Lact. cows and Adult cows (all herds), by years

Conception Rate at 1st service (%)

Year	Heifers	1st Lact. cows	Adult cows
1994	65.6	42.6	34.7
1995	65.1	44.7	36.8
1996	64.6	44.2	36.9
1997	62.7	43.9	35.7
1998	59.6	40.4	33.2
1999	63.3	43.1	36.7
2000	63.2	44.5	37.4
2001	63.9	44.0	37.1
2002	63.8	43.0	36.1
2003	64.6	43.0	36.4
2004	65.9	43.0	35.6
2005	64.2	40.7	32.6
2006	64.3	41.2	33.3
2007	64.3	40.9	33.0
2008	63.1	40.7	30.5

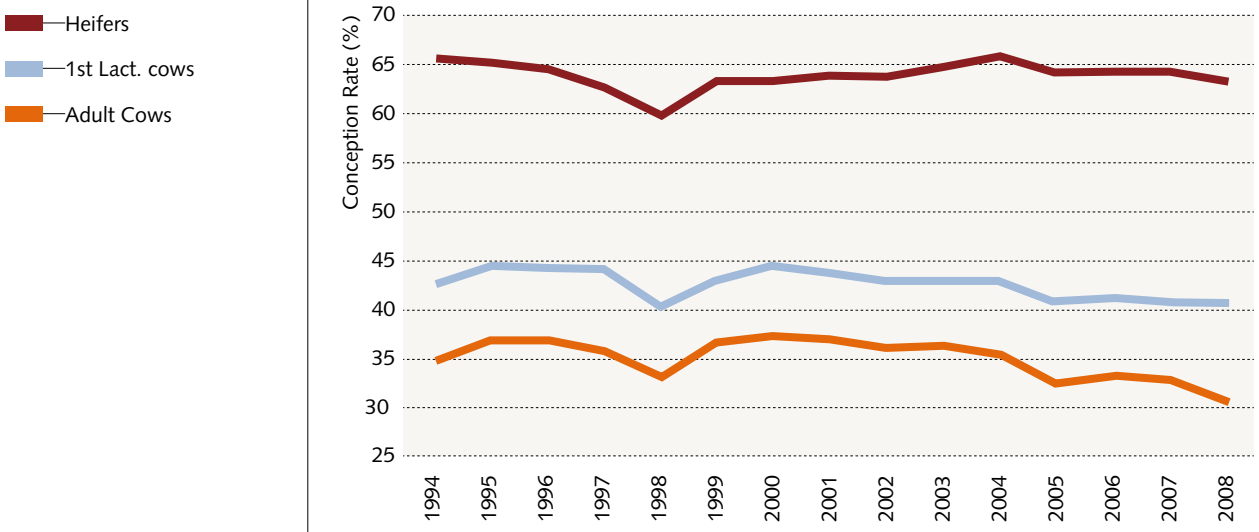

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Table 3.11

Fertility summary for heifers, all herds (period: 11/07 – 10/08)

Number of heifers and Conception Rate, by age at 1st service

	N	% of total	C.R. (%)
< 13 months	17,584	29.9	62.6
14-15 months	36,227	61.6	63.7
16-17 months	4,058	6.9	63.1
18-23 months	941	1.6	53.8
Total	58,810	100	63.1

Number of heifers and Conception Rate, by insemination number

	N	% of total	C.R. (%)
First inseminations	33,686	57.3	63.1
Second inseminations	12,847	21.8	55.1
Third inseminations	5,722	9.7	46.9
Fourth + more inseminations	6,555	11.1	30.5
Total of inseminations	58,810	100	56.2

Heat detection

Distribution of cycles length (days):			
5 - 17	910	4.9	
18 - 15	12,269	65.4	
16 - 35	1,149	6.1	
36 - 60	4,425	23.6	
Total of natural cycles	18,753	89.7	
Induced cycles	2,147	10.3	
Average days between inseminations	27		
Rejections by inseminator		17.8	
Preg.checks with negative results		11.8	

Distribution of heifers by age at pregnancy onset

<13 months	6,525	20.1	
14-15 months	18,312	56.5	
16-17 months	5,279	16.3	
18-19 months	1,638	5.1	
20-21 months	641	2.0	
Average age at effective insem. (mo)	15.2		

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Table 3.12

Fertility summary for first-calvers, all herds (period: 11/07 -10/08)

Number of first-calvers and Conception Rate, by days post-partum at 1st service

	N	% of total	C.R. (%)
< 70 days	10,405	12.4	40.6
71 - 100 days	50,767	60.5	42.4
101 - 130 days	19,216	22.9	38.2
131 - 150 days	3,524	4.2	38.1
Total	83,913	100	40.7

Number of first-calvers and Conception Rate, by insemination number

	N	% of total	C.R. (%)
First inseminations	29,904	35.6	40.7
Second inseminations	18,215	21.7	35.5
Third inseminations	11,862	14.1	32.3
Fourth + more inseminations	23,932	28.5	27.2
Total of inseminations	83,913	100	34.5

Heat detection

Distribution of cycles length (days):			
5 - 17	2,007	5.0	
18 - 15	25,397	63.1	
16 - 35	4,484	11.1	
36 - 60	8,363	20.8	
Total of natural cycles	31,888	89.8	
Induced cycles	4,564	10.2	
Average days between inseminations	27		
Rejections by inseminator		13.3	
Preg.checks with negative results		23.9	

Distribution of first-calvers, by days post-partum at effective insemination

< 75 days	2,416	9.4	
76 - 110 days	9,759	37.9	
111 - 150 days	6,084	23.7	
151 - 180 days	2,860	11.1	
181 - 270 days	4,600	17.9	
Average Open days	129		

➤

Table 3.13

Fertility summary for adult cows, all herds (period: 11/07 - 10/08)

Number of Cows and Conception Rate, by days post-partum at 1st service

	N	% of total	C.R. (%)
< 50 days	1,426	0.8	23.2
51 - 80 days	82,192	46.1	30.1
81 - 110 days	75,417	42.3	31.2
111 - 150 days	19,255	10.8	30.1
Total	178,290	100	30.5

Number of Cows and Conception Rate, by insemination number

	N	% of total	C.R. (%)
First inseminations	59,541	33.4	30.5
Second inseminations	40,923	23.0	31.1
Third inseminations	27,307	15.3	29.7
Fourth + more inseminations	50,519	28.3	25.1
Total of inseminations	178,290	100	29.0

Heat detection

Distribution of cycles length (days):			
5 - 17	6,528	7.4	
18 - 15	51,576	58.4	
16 - 35	12,214	13.8	
36 - 60	18,071	20.4	
Total of natural cycles	88,389	88.5	
Induced cycles	11,451	11.5	
Average days between inseminations	27		
Rejections by inseminator		10.2	
Preg.checks with negative results		30.2	

Distribution of first-calvers, by days post-partum at effective insemination

< 75 days	5,847	12.5	
76 - 110 days	15,418	33.0	
111 - 150 days	11,452	24.5	
151-180 days	5,666	12.1	
181-270 days	8,322	17.8	
Average Open days	129		

Hachaklait Veterinary Services

Written by Dr. Nadav Galon, Chief Veterinarian

The Beginning

Hachaklait was established back in 1919 by a handful of enthusiastic pioneer farmers. The vision they had was to combine a mutual insurance policy with comprehensive veterinary medicine. The initial motive was to protect valuable cattle, which were imported into a hot land, burdened with disease. Hachaklait was founded as a cooperative, which was owned and managed by the farmers for the benefit of the farmers. The veterinarians were contracted as the employees of the cooperative. From its small beginning as a few farms around the Sea of Galilee, Hachaklait grew hand in hand with the Israeli Food Animal Industry to encompass the entire country.

Our Mission

Today, almost 90 years later, Hachaklait is still a strong and thriving unique organization both in size and philosophy, in the veterinary world. Hachaklait is a farmer cooperative, still owned and managed by the farmers for their benefit. Our basic goal is to give our clients the best veterinary service at a reasonable cost. Each farm pays a yearly fixed rate per animal in order to cover all routine and emergency medical needs. Thus, Hachaklait has a long term and stable contract with the farm, and is committed to the well being of the animals, and the sound economy of the farm.

The Services

Hachaklait believes in intensive service at all levels: sick individual cows, herd health, prevention and control of infectious and production diseases, as well as food safety and animal welfare. Our vets visit each farm two to three times a week, and each cow receives several routine visits per lactation, to make sure she is producing at maximal efficiency. All the cows are checked after calving for both clinical and sub clinical diseases, for reproductive status and before drying up. All the data from each individual cow is collected at the farm and processed by Hachaklait. Hachaklait has its own clinical research unit to perform clinical field trials in collaboration with local as well as international companies and research bodies.

Clientele

Hachaklait serves more than 800 dairy farms with over 90,000 milking cows, which comprise about 80% of the dairy cattle population in Israel. These are made up of 160 large Kibbutz herds and 650 smaller Moshav (family) dairy farms. There are some 60 beef herds with 20,000 dams and some 300 feedlots with 30,000 steers, as well as 200 sheep and goat farms.

Personnel

Thirty-six of Hachaklait vets serve as district practitioners throughout Israel.
Ten junior vets operate as relief (locum) for the district vets and for special tasks. Some of our vets operate part time as consultants for: Clinical nutrition, dermatology, parasitology, lameness, young stock, ultrasonography, beef, feedlot and small ruminants.

Department of Herd Health

Hachaklait Department of Herd Health produces a monthly and an annual herd report for each computer- managed farm, monitoring and analyzing its production, reproduction and economical performance. Our herd health experts meet with the manager and staff of every farm to present and discuss their findings and advise them regarding future improvements.

Clinical Research Unit

Hachaklait Clinical Research Unit functions as a CRO for national and international companies. Additionally, the unit provides epidemiological and statistical support to Hachaklait veterinarians involved in research projects.

Drugs

Since almost all veterinary drugs in Israel are imported, Hachaklait handles registration, importation and distribution of a wide range of drugs, vaccinations and equipment. In order to perform this task, Hachaklait operates a large and modern central drug warehouse. Being the dominant drug buyer in the country and one of the largest veterinary groups in the world, we can offer our clients drugs at very competitive wholesale prices. In addition, drugs are sold without any surcharge. We advocate for low and rational drug use and the prevention of drug residues from entering into the food chain. Hachaklait strongly believes that its intensive farm visits routine and herd-monitoring activities reduce our clients' drug use, drug costs and increase their product safety.

Our Affiliations

Hachaklait Head Office and its Chief Vet keep close ties and work relations with the following bodies: The Milk Board, the Israeli Cattle Breeders Association, the National Herd Book, Sion (the Israeli A.I. company), the Milk Quality and Udder Health Lab, The National Veterinary Services and the Kimron Veterinary Institute, the Koret Vet School of the Hebrew University, the Ministry of Agriculture Extension Service and some other international organizations including the WAB.
Hachaklait promotes various means of continuing education for our vets and clients, in the form of conferences, meetings and formal studies, to keep them up-to-date with the vast changes in veterinary knowledge.

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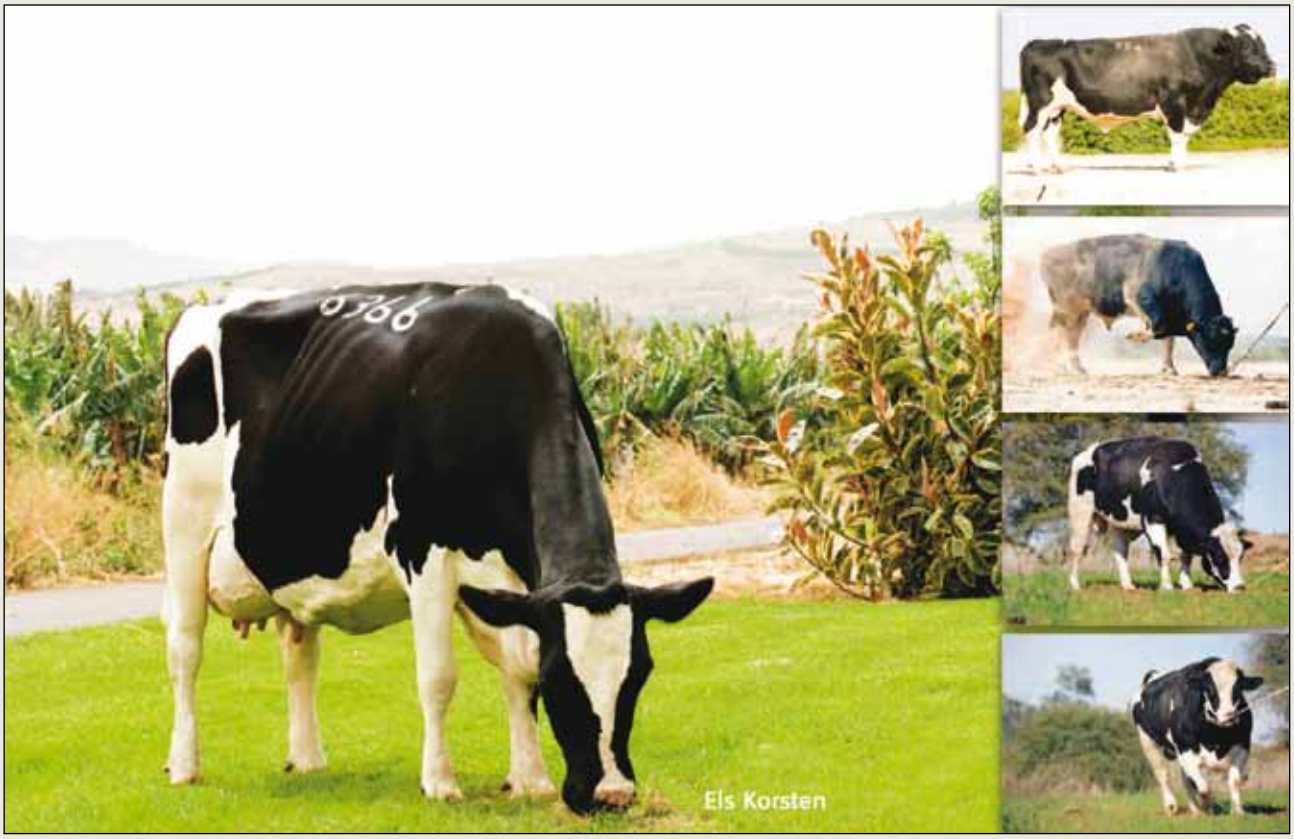

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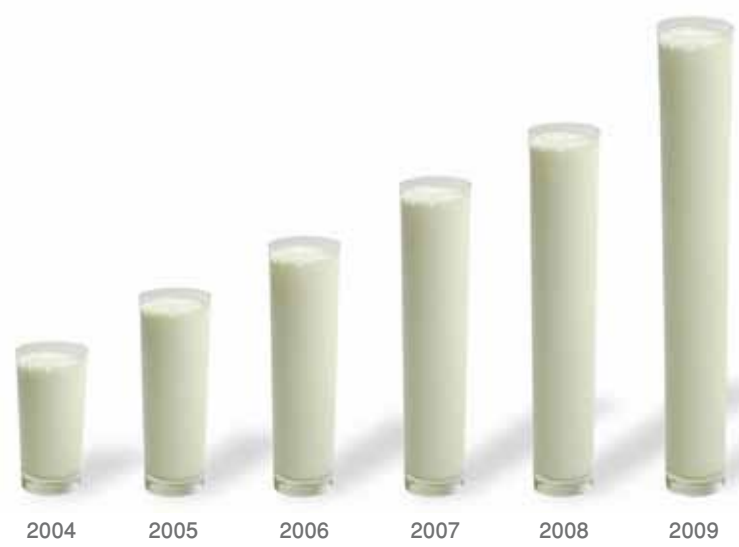

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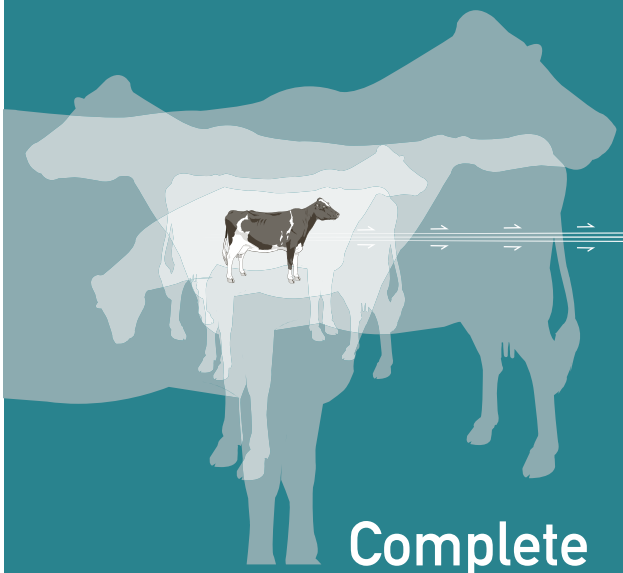

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