

THE ISRAELI DAIRY FARMING: A DOCUMENTATION

Bart A. Wallang¹ and Myrna B. Walsiyen²

¹Student, Bachelor of Science in Agriculture major in Animal Science

²Adviser, College of Agriculture, Benguet State University, La Trinidad, Benguet

ABSTRACT

This study was conducted to document the Israeli dairy farming which includes dairy farmers, their operations and management practices, milk production performance, and milking procedures at Kefar Vitkin, Kibbutz Hama'apil, Kibbutz Ma'abarot, Kibbutz Eyal dairy farms and some Kibbutz farm in the northern part of Israel.

The data gathered were based on the researcher's observations, personal interview with the dairy farm owners and workers including Mr. Adin from the Ministry of Agriculture, Israel.

Dairy farming in Israel is operated by two large sectors, the Moshav (private owned) and the Kibbutz (communal). Each dairy farm, may it be controlled by a Moshav or a Kibbutz, is given a quota by the government as to the volume of milk that it should produce. All the milk produced by the different dairy farms are monitored by the government. Any excess milk produce over the farm quota is bought at 75% lower than the regular price.

There is only one dairy breed maintained by the farmers. The Israeli Holstein breed was developed by the Israeli Breeders Association from a cross between the German Holstein bull and the Israeli Damascus cow.

Dairy farmers breed their heifers at 15 months old for these heifers to have their first calving at 24 to 25 months old. Cows are bred 70 days after calving, however, for second timers, breeding is done 80 days after calving. This is to have a continuous milk supply. Cows are milked for a period of seven months from calving, after which, they are allowed to dry off for a period of 80 days for the second timers and 70 days for older cows.

Calves are separated from the cows immediately after birth and are subjected to dehorning at two months old.

Milking of cows is done twice a day but some milk their cow three

times a day. Cows are milked using milking machines particularly the claw type milking machine. The volume of milk produced by the Israeli Holstein cow per day can be as high as 46 liters particularly during the winter season. During summer, milk production is reduced by 15%. On the average, the Israeli Holstein cow produces 36 liters of milk per day or 11,118 kg of milk per year containing 3.14% protein and 3.58% fats. The peak of milk production is reached on the third week of second month of lactation and start to decline on the third month.

The different dairy farms have to maintain good milk quality to get a good price. To do this, each farm has its own nutritionist who are responsible in formulating the ration of the dairy farm animals.

Each farm has also its own veterinarian who visits the farm twice a week to look into the health of the animals and to perform insemination. Furthermore, the dairy farmers keep abreast with the Dairy Industry for new information or disease warning on dairy farming through the internet.

KEYWORDS: Dairy Farming, Israel

INTRODUCTION

Israel is one of the leading countries in agriculture in the world; it was called then the land of flowing milk and honey. It is because of the abundance of these products. In dairy farming, Israeli Holstein cow has the highest milk production per day all over the world, thus they are exporting calves and from other countries are adopting some of the Israeli dairy farming technologies. Because of the abundance of milk throughout the country, the Israeli government provides a quota for every dairy farm and this determines the number of stocks to be maintained by the farm.

Dairy farming is one of the biggest sources of income by the Jewish people and it is divided into two large settlement sectors, the so-called Moshav/Moshavim (plural) and the Kibbutz/Kibbutzim (plural). Moshav dairy farm is a private farm owned by a single person or one family and a Kibbutz dairy farm is similar to a big cooperative that is owned by the whole community or it is a communal farm.

Israeli Dairy farming was one of the largest branches of agriculture in 1999 and maintained a consistent growth over the years. Since 1990, the growth of the dairy sector is 4% per annum. Israel developed especial husbandry and feeding methods, which are suitable for their climatic condition and the constraints of land and water. Many years of implementing these pro-



cedures have converted milk production in Israel to a highly advanced and effective computerized system. The process aimed at achieving better efficiency and more streamlining in Israeli dairy farms. This has gone on uninterruptedly and consistently for some five decades, and is manifested by the high milk yields per cow.

This study will give some information about Israeli dairy farming that could serve as guide or basis to students, researchers and dairy producers. It may even encourage other people to invest and establish a dairy farm to compensate the milk shortage of our country.

It is interesting then to make a documentation on the dairy farming in Israel to determine their operations and management practices most especially that the Israeli Holstein cow is claimed to have the highest milk production per day. There must be something unique in their technologies that lead other countries to adopt it and even import their calves.

Objectives of the Study

Generally this study aimed to document the Israeli dairy farming which includes their operations, management practices, and milk production.

Specifically, it aimed to determine the following:

1. To find out the calf management practices in an Israeli dairy farm;
2. To determine the management practices of dairy cows in Israel;
3. To find out the management practices of heifers and dry cows;
4. To determine the milk production performance of the Israeli Holstein cows;
5. To find out the milking procedures.

METHODOLOGY

The study was conducted at Kefar Vitkin, Kibbutz Hama'apil, Kibbutz Ma'abarot, Kibbutz Eyal, other dairy farms within the northern part of Israel and at Giv'at Haviva. These places were chosen because it is where the large commercial dairy farms are located.

This documentation was done in Israel from February, 2006 to September, 2006.

There were seven respondents in the study. It was limited to the owners or workers of the dairy farms namely: the Arnon Oshri (Moshav) in Kefar Vitkin; two workers at Kibbutz Hama'apil; two workers at Kibbutz Ma'abarot,



and one worker at Kibbutz Eyal dairy farm. The respondents were chosen by chance with the help of the program AGROSTUDIES Israel. Included in the respondents was Mr. Gabi Adin from the Ministry of Agriculture Israel (MAI) who was tapped by AGROSTUDIES Israel to give a series of lectures on Israeli dairy farming to their international students at Giv'at Haviva, Israel. The researcher is one among the students.

The researcher believed that the respondents are the best informants because they are managing and working in a big commercial dairy farm which was selected by the program (AGROSTUDIES Israel) to be visited by the international students from Myanmar and the Philippines.

Information gathering was done through interviews, observations, photo taking and a series of lecture on the management practices being done on the Israeli dairy farms. The owners or the workers were asked about their management practices, then after the interview, the researcher walked around the farm for observation and photo taking. Gathering of some informations and technologies about the management practices being recommended by the Israeli government to the Israeli dairy farmers was based on lectures that were provided by Mr. Adin at Giv'at Haviva, Israel.

Documentation was made on the following:

1. Dairy farmers;
2. Management practices of dairy calves, heifers and cows;
3. Milk production performance of cows; and
4. Milking procedures.

RESULTS AND DISCUSSION

Dairy Farmers

Dairy farming in Israel is one of the sources of income by the Jewish people. In most of the places within the community visited by the researcher, there is a dairy farm and is very much supported by the government so the investor has no fear in engaging into this kind of business. According to Mr. Arnon Oshri (dairy farm owner) dairy farmers are divided into two large settlement sectors, the so-called Moshav/ Moshavim (plural) and the Kibbutz/ Kibbutzim. Moshav dairy farmers are private farmers having their own dairy farms and all the income go into their pockets while Kibbutz dairy farmers are working in a dairy farm for the whole community. All the income will be divided by the members of the kibbutz.



Arnon Oshri is one of the Moshav dairy farmers. He is the third generation of his dairy farm that was established by his grand parents. He managed his farm with his family, his wife and two children with the help of one Thai as their caretaker.

Dairy Breeds

Unlike the Philippines, where there are several dairy breeds raised for milk production (PCARRD, 1981), there is only one breed maintained by the Israeli dairy farmers, the Israeli Holstein, and this was confirmed by Mr. Adin in one of his lectures to the AGROSTUDIES Israel students, the researcher being one among them. The Israeli Holstein breed was developed in Israel.

According to Adin (2006), the development of the Israeli Holstein breed started from the importation of a Holstein bull from Germany. This was then used to breed the local available cattle, the Damascus cow. With the efforts of the Israeli Breeders Association (IBA), it undergone several genetic improvements until they produced the Israeli Holstein cow which is number one in the world when it comes to milking efficiency.

In 2006 when the study was conducted, there were 115,000 registered Israel holstein cows.

Feeds and Feeding

The dairy farms have their own nutritionist responsible in formulating the diets of their dairy herd. The nutritionist provides the specific amounts of feedstuff or feed ingredient to be used and the farmer does the mixing using a mixing wagon, according to Mr. Arnon Oshri (2006).

Of the different feedstuffs used in formulating the feeds of the dairy animals as stated by Mr. Adin during the lecture, 70 % of these are imported most especially the wheat bran, corn bran, sorghum, etc. Only 30 % are locally produced due to the limited area for planting feedstuffs. These are wheat hay corn bran, corn hulls, poultry manure, wheat, citrus fruits, breads, etc.

Calves Management

Calving. Assisting the calf at calving is one of the most delicate in calf management because of the sensitivity of the newly born calf. The caretaker then should always be there to assist the calf. Before calving the cow is transferred to the sanitized calving barn (Figure 1). During calving, the calf is cleaned with a clean cloth especially the nose and mouth and then transferred immediately to the properly sanitized nursing pen with sufficient light. This finding corroborates to what was cited by Davis and Drackley (1998).



A case of dystocia or difficulty in giving birth, was observed at Kibbutz Ma'abarot. The caretaker inserted his hand protected with plastic cellophanes into the anus of the cow to sense the calf inside. With the use of a simple machine with a tie, the forelegs of the calf was tied and pulled by the caretaker.

Housing. After calving, the calf is transferred into the properly cleaned and sanitized nursing pen (Figure 2) with proper lighting.

Feeding. After calving, the calf is not allowed to suck the milk from its mother. Instead the milk is collected from the cow and given to the calf.

Just after calving, the calf must be given 1.5-2 liters of colostrums (Figure 3). Another 1.5-2.0 liters of colostrums I is given to calf after 6 hours from calving. After Another 1.5- 2 liters of colostrums I is given to the calf. A normal calf must drink 4 liters of colostrum I until the third day and colostrum II and III from 4- 7 days old. The calf must consume at least 10% of its body weight per day, which corroborates the statement to Davis and Drackley (1998). In case the calf will not consume the milk that is provided then it will be forcefully fed directly into its stomach with the use of a rubber hose. The feeding program of calves, composition of colostrum and water consumption of dairy calves are presented in Tables 1, 2 and 3. These are more or less followed by all dairy farms in Israel according to Mr. Adin (2006).

Table 1. Feeding program of calves

AGE (days)	DAY	lt/DAY	lt/TOTAL	FOOD
0-3	3	4	12	colostrum I
4-7	4	4	16	colostrum II/ milk
8-21	14	3	42	milk+ replacement
22-45	24	4	96	milk+ replacement
46-55	15	3	45	milk+ replacement

Source: Adin, 2006

Table 2. Colostrum and normal milk component

COMPONENTS	COLOSTRUMS			NORMAL MILK
	1st	2nd	3rd	
Total solids (%)	23.9	14.1	13.6	12.9
Fat (%)	6.7	4.4	4.0	3.5
Protein (%)	14.0	5.1	4.1	3.1
Lactose (%)	2.7	4.4	4.7	4.7
Vitamin A (µg/dl)	295	113	74	34
Immunoglobulin (%)	6.0	2.4	1.0	0.1

Source: Adin, 2006



Table 3. *Water consumption of dairy calves*

HOLSTEIN CALVES	LITERS/DAY
1 month old	4.9-5.8
2 month old	5.7-9.1
3 month old	8.0-10.6
4 month old	11.4-13.2

Source: Adin 2006

Dehorning. At two months old when the horn button takes shape, calves are dehorned to minimize injury that may occur when the calves fight with one another. Some dairy farmers are using heavy-duty electric dehorner but this is seldom used because it is painful to the animal. Others prefer to use the dehorning ointment (NaOH) because it will not hurt the animal.

Removing extra teats. In case the calf has extra teats, these are clipped or cut at two weeks old because extra teats will interfere with the milking machine. Extra teats often leak and are prone to mastitis.

Weaning. Calves are separated on the day after calving. The caretaker will provide all the care and milk that is needed by the calves. This finding is similar to what Davis and Drackley (1981) claimed. They cited that calves should be separated from the day within the first 12 hours after birth. When the calf is about 55 to 60 days old, males are selected and sold to the beef raisers or breeder raisers. Female calves are retained by the owner to serve as replacements for culled cows or to have additional stocks.

Heifer Management

According to Mr. Adin, management of heifers in Israel has following the main goals are as follows; for replacement, to increase the dairy cows in the farm; and finally to achieve first calving at 24 to 25 months. Achieving these goals will mean more calves produced, and more peaks of lactation in cow's life; short pause between generation and fast genetic advancement; and shorter number of days of rearing making refund more efficient.

Breeding. Generally the practice of the dairy farmers is to breed the heifers at the age of 13 months. All the farms employ artificial insemination in breeding their heifers and cows. Heifers that come into heat are brought to the inseminating barn (Figure 4) and are inseminated by the farm veterinarian who visits the farm twice a week. The semen introduced into the heifers and cows comes from one company that produces the best bulls for breeding. Insemination is done early in the morning or late in the afternoon.



Feeding. According to Mr. Oshri, the dairy farmers regulate the feed allowance of their heifers to prevent them from becoming too fat or too thin. Feeding is done once a day in the morning using a tractor operated by the caretaker and this was confirmed by Mr. Adin in one of his lectures to AGROSTUDIES students.

Each farm has its own feeding and drinking guide as determined by its respective nutritionist. Table 4 and 5 presents the sample feeding and drinking guide for heifers presented by Mr. Adin.

Housing. Heifers are separated from the cows. These are raised in separate shed with open sidings so that the air can easily circulate. Illustration of heifers shed is shown in Figure 15.

Costing. Compared to United States of America, the typical breakdown of heifer expenses from birth to calving (Table 6) shows that Israel has higher expenses.

Table 4. Feeding replacement heifers (0-24 months)

AGE (mos)	BW Kg	DMI %BW	DMI KG	CP %	ME Mcal/kg	NE DM	ROUGH-AGE %	PRACTICAL SOLUTION
0-2	50	2.8-3.0	1.0	18	3.0	1.8	0-10	Calves TMR; Starter conc.
2-3	80	2.8	2.25	18	3.0	1.8	10-15	Calves TMR
3-6	140	2.7	3.0-4.0	16.5	2.60	1.65	40	Milking cow TMR + 1 kg legume hay
7-12	250	2.5	5.0-7.0	14.0	2.30	1.40	40-50	Heifers TMR: 13%CP + 2 Kg DM MC- TMR
13-18	360	2.3	8-9	13.0	2.25	1.30	50	Heifers TMR ad lib
19-23	500	2.0	10-11	12.5-13.0	2.25	1.30	50	Heifers TMR 11 Kg DM

Source: Adin, 2006

Table 5. Drinking water consumption of dairy heifers

AGE OF HOLSTEIN HEIFERS	LITERS/DAY
5-14 months old	14.4-17.4
15-17 months old	22.3-28.9
18-24 months old	27.6-36.6

Source: Adin, 2006



Table 6. Typical breakdown of heifer expenses from birth to calving

EXPENSES		USA (US\$)	ISRAEL (US\$)
Operating cost			
Feed	54.6%	550	760
Labor	12.6%	144	141
Vet & Medicine	3.7%		
Breeding, Bedding	5.7%		
Interest on investment	8.7%	218	100
Initial value of heifer	8.0%		
Death loss (12%)	3.5%		
Ownership cost			
(Buildings, utilities, taxes)	3.2%	240	200
TOTAL		1152	1201

Source: Adin, 2006

Cow Management

According to Mr. Oshri, cow management starts from breeding up to calving. This includes milking, cooling during summer, feeding, and housing.

Breeding. Generally the dairy farmers breed their cows 70 days after calving but for the second timer cow she is bred 80 days after calving. This is to have a continuous supply of milk. Like the heifers, cows that get in heat are transferred to the inseminating barn and are inseminated by the veterinarian. Breeding is done early in the morning or late in the afternoon.

Feeding. Ad libitum feeding (Figure 5) is practiced to lactating cows with a high quality of feeds and this is true to all the Kibbutz and Moshav dairy farms. According to Mr. Adin about 20 feed stuffs are being mixed using a mixing wagon with the help of the farm nutritionist who provides the specific quantities of each feedstuff. Water is provided ad libitum. Unfortunately the dairy farm owners/workers hesitated to give the researcher the feeding guide they are observing for their cows.

Housing. The housing for the Israeli dairy cows are adapted to the local condition. Some are with monitor type roofing either single span for double span or semi-monitor type with open sidings. The height is about 3-5 meter from the top and it is furnished with air coolers. The flooring is designed for the convenience of the caretaker so that the tractor can be driven inside for cleaning the manures and during feeding.

Cooling. During summer time, it is a common practice of the dairy



farmers to operate their coolers (big fan with water outlet) according to the farm owners and as observed by the researcher. This is to maintain the body temperature of the animal or to cool the cow to avoid heat stress that results to lower milk production. The coolers may be located at the side (Figure 6) or at the center (Figure 7). When the air cooler is turned on, water is blown into the cow for 30 seconds thus the cow will be wet. Then the water is automatically turned-off while the air is continuously blowing the wet animal. After 5 minutes the water is automatically turned-on again and this is repeated through out the day mostly from 7 in the morning to 7 p.m depending on the temperature.

Milking. During milking, the cow is brought to the milking shed or milking station. Most of the dairy raisers milk their cows two times a day, morning and afternoon. But now a days, most of the dairy raisers in Israel milk their cows three times a day according to Mr. Oshri; early in the morning, at noon time and at 7 p.m. in the evening. They milk their cows with the use of milking machine, either the claw type (Figure 8) or the robotic arm milking machine (Figure 9). Cows are milked for a period of seven months starting from calving.

Dry Cow Management

According to Mr. Arnon and Mr. Adin, after seven months of milking, the cow has her dry period 80 days for the first timer and 70 days for the old cows. The dry cow is fed with high quality feeds and supplied with vitamins A and E. Feeding is done once a day in the morning with proper diet to avoid the cow from becoming too fat or too thin but it is provided with ad libitum water. Dry cows are confined separately from the milking cows.

Milk Production

Volume. Israel produces approximately 1,150,000 tons of cow's milk per year. Milk production is influenced by the age of the cow, season and month during lactation period. During the peak production, milk production can go to as high as 46 liters per day particularly during winter. During summer, milk production declines to 15%. However, on the average, the daily milk production per cow is 36 liters.

He also stated that Israeli Holstein produces 11, 118 kg of milk per year containing 349 kg (3.14 kg) of protein and 398 (3.58 %) of fats.

Peak of milk production. From calving, the volume of milk produced per day per cow gradually increases and reaches its peak at the third week of the second month of lactation. On the third month of lactation, milk production starts to decline (Figure 10).





Figure 1. The calving barn (Kibbutz Ma'abarot dairy farm)



Figure 2. Nursing pens (Kibbutz Hama'apil)



Figure 3. Inseminating barn (Arnon Oshri dairy farm)



Figure 4. Heifer shed (Mr. Arnon dairy farm)



Figure 5. Ad libitum feeding of cows (Kibbutz Ma'abarot farm)



Figure 6. Side cooler (Kefar Vitkin)



Figure 7. Center coolers (Arnon farm)



Figure 8. Milking station (claw type) at Arnon's farm



Figure 9. Robotic arm milking machine (Kefar Vitkin farm)

Milk collection. The milking machines are directly attached to a pipe that leads to a tank (Figure 11) so that the milk of all cows milked go into a collecting tank that has a temperature of 6 degrees Celsius for storage. Attached to the pipe is a milk meter that reflects the volume of milk collected from each cow. Every two days, the milk processing company goes to the dairy farms and collects the raw milk and processed it into more than 1,000 different milk products. This is true to all the dairy farms observed.



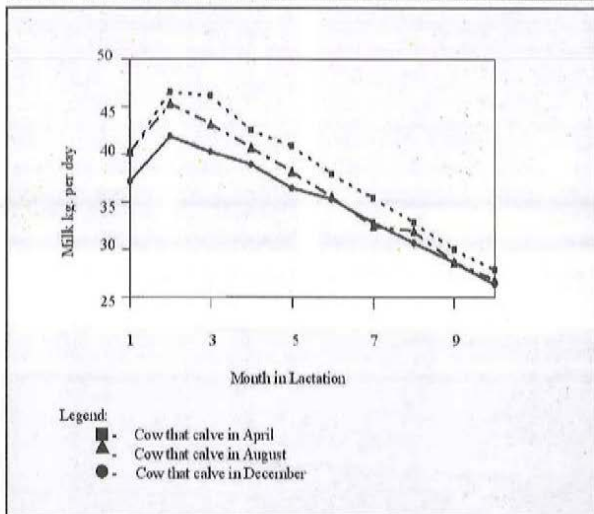


Figure 10. Actual milk production of the Israeli Holstein (presented by Adin 2006)



Figure 11. Milk tank with six degrees Celsius temperature (Kefar Vitkin)

Milk pricing. According to Mr. Arnon Oshri and Mr. Adin, the Israeli government provides quota to the dairy farmers to maintain uniformity of milk produce through out the year and to maintain the good price. Pricing of milk depends on the agreement of the government, farmers and dairy industries. The price reflects the quality of milk, average cost of production plus the agreed return for the farmers labor and the invested capital. If the farmer exceeds the quota given to him, the price of the excess milk he produced, is 75% of regular the price.

In terms of quality, the lower the number of bacteria found in the milk, the higher is the price.

Culling of Stocks

In culling of stocks, all animals with abnormalities, cows that do not reach the average milk production and cows that have severe diseases are culled. Male calves are selected and sold to the breeder raisers or the beef raisers.

Animal Health

According to the respondents, their farms have their own veterinarians and the veterinarian visit the farm two times a week to check the animals and to inseminate in heat cows. Aside from this, the farm is closely in contact with the veterinarian through the use of computer. The dairy industry is sending information about animal health and warnings in case of disease outbreaks.

Because of the above, coupled with the general preventive measures against diseases observed by the dairy farms like maintenance of good sanitation, the good health of the dairy animals is well maintained.

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

This study was conducted to document the Israeli dairy farming, their operations and management practices, milk production performance and milking procedures at Kefar Vitkin, Kibbutz Hama'apil, Kibbutz Ma'abarot, Kibbutz Eyal dairy farms and some Kibbutz farm in the northern part of Israel.

The data gathered were based on the researcher's observations, personal interview with the dairy farm owners and workers including Mr. Adin from the Ministry of Agriculture, Israel and the series of lectures that he gave to the AGROSTUDIES Israel students in which the researcher was one of them.



Dairy farming in Israel is operated by two large sectors, the Moshav (private owned) and the Kibbutz (communal). Each dairy farm, may it be controlled by a Moshav or a Kibbutz, is given a quota by the government as to the volume of milk that it should produce. All the milk produced by the different dairy farms are monitored by the government. Any excess milk produced over the farm quota is bought at a reduced price i.e. 75% of the regular price.

There is only one dairy breed maintained by the farmers, the Israeli Holstein breed. This breed was developed by the Israeli Breeders Association from a cross between the German Holstein bull and the Israeli Damascus cow. This breed is now considered the highest milk producer in the world according to Mr. Adin (2006).

Dairy houses are either of the monitor type (single span or double span) or the semi-monitor type for better ventilation. Dairy houses are furnished with coolers to the cows or to avoid heat stress among cows.

Dairy farmers breed their heifers at 15 months old for these heifers to have their first calving at 24 to 25 months old. Cows are bred 70 days after calving, however, for second timers, breeding is done 80 days after calving. This is done to have a continuous milk supply. At birth, the calf is immediately separated from the cow and is not allowed to suck milk from its mother. Instead, the milk is collected from the cow and given to the calf. At two months old, the calf is subjected to dehorning. Any extra teats, if there are, are also clipped. Cows are milked for a period of seven months from calving, after which, they are allowed to dry off for a period of 80 days for the second timers and 70 days for older cows.

Milking of cows is done twice a day but some milk their cow three times a day. Cows are milked using milking machines most especially the claw type milking machine. The volume of milk produced by the Israeli Holstein cow per day can go to as high as 46 liters particularly during the winter season. During summer, milk production is reduced by 15%. On the average, the Israeli Holstein cow produces 36 liters of milk per day or 11,118 kg of milk per year containing 3.14% protein and 3.58% fats. The peak of milk production is reached on the third week of the second month of lactation and start to decline on the third month.

Milk produced is stored in a tank which has a temperature of six degrees Celsius and the milk processing company comes to collect it every two days.

The different dairy farms have to maintain a good quality of the milk to maintain also a good price. To do this, each farm has its own nutritionist who is responsible in formulating the ration of the farm dairy animals.



Also each farm has its own veterinarian who visits the farm twice a week to look into the health of the animals and to perform insemination. Furthermore, the dairy farmers keep abreast with the Dairy Industry for new information or disease warning on dairy farming through internet.

Conclusion

The Israel dairy industry is well developed and organized. The management practices observed in the different dairy farms are almost the same because the Ministry of Agriculture Israel provides all the guides in dairy farming. They are well supported by the government and they are equipped with high technologies.

Recommendation

The Filipinos can adopt the Israeli dairy farming. The government should give a full support to the dairy farmers so that they will not be discouraged and investors will be encouraged to invest in dairy farming in order to compensate the milk shortage of the country.

LITERATURE CITED

- ADIN, G. 2006. Power Point Presentation on Israeli Dairy Farming During the AGROSTUDIES Israel Program. 2005-2006. Giv'at Haviva, Israel.
- DAVIS, C.L. and DRACKLEY, J.K. 1998. The Development, Nutrition and Management of Young Calf. Iowa State University Press, Ames, Iowa. Retrieved March 14, 2006 from <http://animsci.agrenv.mcgill.ca/courses/450/topics/5.pdf>
- ETGEN, W.M. and REAVES, P.W. 1978. Dairy Cattle Feeding and Management. Six edition. John Wileys and Sons incorporation.
- OSHRI, A. 2006. Management Practices of Kefar Vitkin Dairy Farm. (personal interview)
- PAYUMO, F. 2006. Philippine Dairy Farming. Retrieved September 09, 2006 from http://www.abs_cbnnews.com/story_page.aspx?storyId=47497
- PCCARD. 1981. The Philippines Recommends for Dairy Cattle Production. Reprinted and Exclusively Distributed by National Book Store Inc.
- YARON, L. 2004. General View of the Israeli Dairy Farming. Retrieved November 2006 from http://www.vcn.vnn.vn/sp_pape/sp_paper2004/sp_paper_2004_2.htm

