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CHARACTERISATION OF DAIRY FARMING SYSTEMS IN UPPER EGYPT

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SUMMARY

Ninety seven dairy farms under mixed farming system located in (El-Waqaff, 31 farms – Qafft, 27 farms –Qana, 39 farms) in Qana governorate in Upper Egypt were selected with the objectives to characterize the existing dairy farming systems. A questionnaire was designed and pre-tested to obtain data on average crop production, farm size, artificial insemination (AI), animal feeding, average milk production in dairy farms, milk revenue and feeding cost.

The results showed that average cultivated areas/farm was 23.02, 9.15 and 7.07 feddan (1 feddan = 4200 m^2) for the studied districts, respectively. Percentages of milk revenue minus feeding cost in the three districts were 23%, -0.04% and .04% for local cows; 31%, 09% and 44% for buffalo and 22%, 07% and 12% for crossbred cattle for the same districts, respectively. Average milk productions were 4.50, 5.00 and 6.42 kg/day for local cows, buffalo and crossbred cows in EL-Waqaff, respectively. While in Qafft and Qana the average milk production was 4.23, 5.05 and 6.79 kg/day and 4.10, 6.02 and 6.29 kg/day for the same genetic groups, respectively.

Main fodder crops per farm in summer were: sorghum (2.19, 1.20 and 1.50 kirat) (1 feddan = 24 kirat), darawa (1.37, 1.11 and 1.14 kirat), respectively and alfalfa (2.17, 1.14 and 1.00 kirat), respectively in El-Waqaff, Qafft and Qana, respectively. While fodder crops per farm in winter were berseem (3.33, 1.35 and 1.26 kirat), respectively and alfalfa (2.91, 1.13 and 0.67 kirat), respectively in those three respective areas. It could be concluded that most farmers need simple animal feeding technical inputs to improve animal productivity

Keywords: Dairy farm characterization, mixed farming systems, Upper Egypt

INTRODUCTION

Studying farming systems in Upper Egypt is important so as to get a clear picture of the prevailing production systems and in particular the dairy systems and how far they have evolved over time. Milk marketing structure should also be appraised since it has been learnt from the previous studies that development of small-scale dairy system is a function of milk demand and the product delivery systems. Moreover, the fast changes in milk marketing as a consequence of a liberalized economy have created opportunities for growth in dairy production and milk outlets that have not been adequately studied in these parts of the country.

The main problem to improve animal production is animal feed which is not efficiently utilized in Egypt. In winter there is a surplus of green forage over the animal feed requirements while in summer there is shortage (Hathout *et al*., 1996). In addition, the concentrates are expensive where most farmers cannot afford it.

Moreover, there is a great competition for cultivated area between cash crops on one hand (corn, rice, bean and wheat) and green fodders on the other hand. Egypt still imports almost 55% of wheat requirements (MALR, 2005). Smallholder dairy production can be improved in the mixed farming system as it offers the opportunity to diversify operations, spreads risk and provides regular income (Gryseels, 1988). The present study will help better understand common dairy systems and agriculture in Upper Egypt. Also it will help to identify constraints, and opportunities for, their improvement, and refining the recommendation domains for the pilot interventions to be selected with stakeholders: the producers, the market agents, the regulators and the policy makers.

The objective of this study was to describe existing dairy farming systems in Upper Egypt in mixed farming systems and formulate recommendation to set up policies and technical intervention.

MATERIALS AND METHODS

The present study was conducted based on the secondary and primary data collected through a questionnaire on farms that are practicing mixed dairy farming in Upper Egypt. The study was conducted on 97 dairy farms in three districts at Qana Governorate. A total of 97 farms, 31, 27 and 39 farms were selected from El-Waqaff, Qafft and Qana districts, respectively. The studied farms were selected as representative of the common dairy farms operated as mixed farming system, where animal raising and crop cultivation activities are practiced. The data on farms was collected during April 2007.

A questionnaire was developed and pre-tested on a limited number of farms with good experience in livestock practices. The data collected were average crop production, farm size, crop cost and revenue, average, animal feeding, family size and average milk production in dairy farms. Milk revenue minus feeding cost was calculated. The collected data on herd size were converted into Animal Unit (AU) according to (El-Sayes and El-Wardani, 2004). Data were analysed using SAS for Windows (1998). Three models were used to study different factors affecting milk production, green forage areas and number of lactating cows per farm. Average and percentage were calculated for technical and economic variables including milk production, animal stocking rate and farm size.

Model I was used to evaluate variation among districts, species, parity number and seasons in milk production. Model II was to test impact of districts, farm size, districts interacting with farm size and number of animal units on cultivated green forage areas /farm. Model III was run to test impact of districts, farm size in feddan on number of lactating cows/ herd. Details of these models are shown below.

Model I

$Y_{ijklm} = \mu + D_i + G_j + P_k + S_l + e_{ijklm}$

Where

Y_{ijklm} = milk yield of animal;

μ = overall mean;

D_i = the effect of district, i = 1, 2, 3;

G_j = the effect of genetic group, j = (1 = buffalo, 2 = local, 3 = crossbred)

P_k = the effect of parity number, k = 1,2 …..5;

S_l = the effect of seasons of calving, l = winter 2= summer

e_{ijkm}= the residual effect

Model II

$Y_{ijkl} = \mu + D_i + F_j + (Di*Fj) + A_k + e_{ijkl}$

Y_{ijkl} = cultivated green forage area;

μ = overall mean;

D_i = the effect of districts, i = 3;

F_j = the effect of farm size in feddan within districts, j = 3;

A_k = the effect of number of Animal Units k

e_{ijk} = the residual effect

Model III

$Y_{ijk} = \mu + D_i + F_j + e_{ijk}$

Y_{ijk} = number of lactating cows and the rest of symbols as before.

RESULTS AND DISCUSSION

Results indicated that a significant effect of districts ($P<0.05$) was shown on milk yield (Table1). According to Model I milk yield was significantly higher in Qafft than El-Weave and Qana. This result could be due to that, the dairy farms in Qafft are used to some technical packages such green forage conservation and use fenugreek and molasses as feed additives in dairy cows ration. While milk yield showed no significant difference between El-waqaff and Qana.

Table 1. Least squares means (LSM) (±SE) for milk yield per districts, species parity number and seasons of the year

Effects	No. of animals	Milk yield per lactation	
		LSM	±SE
Overall mean	714	1242	7.25
Districts			
El-waqaff	345	1248[b]	11.5
Qafft	117	1314[a]	20.7
Qana	252	1236[b]	13.1
Genetic group			
Buffalo	176	1256[b]	15.8
Local	264	881[c]	15.1
Crossbred	274	1659[a]	12.1
Parity No.			
1	133	1251[c]	17.9
2	135	1284[b]	17.3
3	153	1309[a]	16.2
4	141	1283[b]	17.3
5	152	1198[d]	16.9
Seasons of calving			
Winter	313	1410[a]	12.3
Summer	401	1120[b]	10.8

[abc] Means within a column with different superscript differ significantly ($P<0.05$) (Duncan (1955)

[abc] Means within a column with different superscript differ highly significant ($P<0.01$)

Parity number was significant effect ($P<0.05$) on milk yield between 3 and each of 1, 2, 4 and 5. While, between 2 and 4 were not significant. This results my be attributed to that milk yield tended to be higher in parity number 3 and 4 because the

body has already reached the full size. The first parity cows convert part of their feed to body construction while for the fifth parity or more cows milking glands are less efficient and begin to deteriorate. The average milk yields for three species reached the peak in the 3-4 months of lactation (Hathout *et al*., 1996). This relative long time to reach the peak might be partly attributed to parity number and inadequate feeding regime before parturition. The reason is that, most farmers do not rely on themselves to produce their own heifers, to benefit from milk sale and avoid high mortality of young calves. Farmers prefer to purchase cows in the second, third or forth lactation. Most farmers tended to get rid of low producing cows after the fifth parity. These results agree with (Hathout *et al*., 1996) who found that average milk yield per lactation in the delta region ranged between 1466 and 2109 kg for buffalo and 1465 and 2540 kg for crossbred cows.

Milk yield in winter was highly significant ($P<0.01$) higher than summer season. This result might be attributed to the quality of green forage in winter than summer because, berseem with alfalfa are the main green forage farmers give a big quantity that caver animal feeding requirements. While in summer sorghum and darawa has low protein percentage they can not cover animal feeding requirement. In addition summer is too hot for animals which has negative effect on feed consumption. It was believed that many farmers arrange their breeding plan so that their cows deliver in the summer season to get more milk because average of green forage area in summer represent 52.75% of cropping pattern while, in winter was 31.81%. From the results in table 1 could conclude that balanced rations, hot climate might be play a big role in milk production.

Data in table (2) shows that the effect district, farm size in feddan, interaction between (district and farm size) and Animal Unit (AU) on cultivated green forage areas. According to Model II the districts have no significantly effect on cultivated green forage area. Farm size has significant ($P<0.05$) only was between farm size >20 feddan and other two farm sizes this results which could be due to that, the positive relationship between dairy farms size and size of green forage areas the forage area increased as the farm size increased.

The effect of farm size interaction with districts on cultivated green forage area was not significant. Results indicated that as number of AU per farm increased effect green forage area significantly increased ($P<0.05$). Table (3) shows the effect of districts and farm size on number of lactating cows per farm. Results indicated that a significant effect of districts ($P<0.05$) on number of lactating cows per farm. According to Model III number of lactating cows were significantly higher ($P<0.05$) in El-Waqaff than either Qafft or Qana and Qana was significantly higher than Qafft. This result could be due to that, the dairy farms in El-Waqaff owned larger herds than Qafft and Qana that might be due to organic fertilizer requirement to reclaim land and it consider as a part of social customs.

From the present results observed that farmers in El-Waqaff hold large number of local cows it is easy to manage the herd with a big amount of crops by- products available as a feed resources. In addition local animal more tolerant with desert conditions plus is has annul regular calving. Also the difference between Qana and Qafft was significant that might be attributed to availability of milk markets in Qana. Farmers in Qana holding buffalo cows because buffalo milk preferable for drinking and home consumption.

Table 2. Least squares means of green forage areas (GFA), districts (D), farm size (S) and (AU) in El-Waqaff, Qafft and Qana

Effects	No. of farms	Green forage areas in feddan	
		LSM	±SE
Overall mean	97	3.66	0.29
Districts (D)			
El-waqaff	31	5.08	0.72
Qafft	39	3.85	0.88
Qana	27	4.47	0.79
Farm size (S)			
≤10 feddan	51	2.89[b]	0.66
>10 - ≤20 feddan	29	4.15[b]	0.61
>20 Feddan	17	6.36[a]	1.01
Farm size * districts (D*S)			
≤10 feddan - El-waqaff	3	3.02	1.67
≤10 feddan – Qafft	19	2.62	0.76
≤10 feddan – Qana	29	3.04	0.67
>10 - ≤20 feddan - El-waqaff	15	4.54	0.80
>10 - ≤20 feddan – Qafft	6	3.96	1.23
>10 - ≤20 feddan – Qana	8	3.96	1.07
> 20 feddan - El-waqaff	13	7.71	0.89
> 20 feddan - Qafft	2	4.96	2.06
> 20 feddan - Qana	2	6.41	2.04
Animal Unit (AU)			
>0 - ≤7	34	2.51[c]	0.77
>7 - ≤20	44	4.10[b]	0.52
>20	19	6.80[a]	0.91

[abc] Means within a column with different superscript differ significant (P<0.05) (Duncan (1955)
[abc] Means within a column with different superscript differ highly significant (P<0.01)

Table 3. Least squares means of lactating animals and farm size in El-Waqaff, Qafft and Qana

Effects	No. of farms	Lactated cows in three districts	
		LSM	±SE
Overall mean	97	7.42	0.40
Districts			
El-waqaff	31	10.41[a]	0.75
Qafft	27	5.83[c]	0.87
Qana	39	8.09[b]	0.79
Farm size in feddan			
≤10	51	6.13[c]	0.64
>10 - ≤20	29	7.39[b]	0.77
> 20	17	10.81[a]	1.08

[abc] Means within a column with different superscript differ significant (P<0.05) (Duncan (1955)
[abc] Means within a column with different superscript differ highly significant (P<0.01)

Number of lactating cows were highly significant by (P<0.01) the highest for (>20 feddan) and the lowest for (<10 feddan) and it was significant between farm size (>10 - ≤20 feddan) and (<10 feddan). Data in table 3 shows positive relationship between cultivated area and number of AU with green forage area this result might be attributed to high proportion of dairy cows in a large herd size and cultivated areas than small herd size.

The results in Table (4) indicated that almost two third farmers in El-Waqaff and Qafft heard about AI, but they reported that it was not available, while almost 10% of the farmers in the same areas mentioned that AI was unknown. There were 25.8% and 19.1 of farmers in El-Waqaff and Qana said that they did not trust of AI technique. AI applied in Qafft for about one quarter of studied farm and 21.4% in Qana. Farmers in El-Waqaff district refused to apply AI techniques probably related to the herd structure where local breed is dominant and calves stayed with their mothers for suckling until dry-off it might also attribute to the distance between farms location and the veterinary administration.

Table 4. Artificial Insemination (AI) practices in El-Waqaff, Qafft and Qana

	Artificial Insemination (AI)			
	Not available %	**Unknown %**	**No trusting %**	**Applied %**
El-Waqaff	64.5	9.7	25.8	0.0
Qafft	63.0	11.1	0.0	25.9
Qana	26.2	33.3	19.1	21.4

The average adoption rate for AI in the three districts was 0.0, 4.3 and 4.9 times per farm in Qafft and Qana districts.

Animal feeding systems of three distracts:

Daily feeding systems in summer per farm are presented in Table 5. Sorghum, darawa and alfalfa were the main fodder crops. The amount of concentrate given to buffalo showed little differences to cow i.e. 2.93, 5.17 and 4.00 kg/day for adult's animals and 1.33, 1.79 and 0.99 kg/day for follower in the three areas, respectively. The stocking rate, counted as the result of the average green forage consumption in cultivated areas per farm divided over the average AU of the same farm However, it was a little bit lower in summer i.e. 3.61, 4.20 and 4.74 AU/feddan for the same studied areas, respectively. In other words, each Animal Unit were given green forage for 6.79, 7.75 and 8.45 kirat in summer for El-Waqaff, Qafft and Qana, respectively.

On the other hand, in winter season feeding system is presented in Table 6. Alfalfa and berseem became the main fodder crops. Green forages are fed to all animals as a group feeding so it is so difficult to calculate the quantity per dairy cow or young stock or sheep and goats.

The stocking rate were 4.66, 6.15 and 8.72 AU/ feddan in winter for El-Waqaff, Qafft and Qana, respectively. In other words, each Animal Unit were given green forage for 8.45, 7.23 and 5.39 kirat in winter for El-Waqaff, Qafft and Qana, respectively.

Table 5. Average daily consumption of summer green forage from sorghum, alfalfa, darawa, straw and concentrate for dairy animal in El-Waqaff, Qafft and Qana districts

	Sorghum/farm/day		Alfalfa/farm/day		Darawa/farm/day		Straw	Concentrate feed (kg/head)			
	Kirat	Kg	Kirat	Kg	Kirat	Kg	Kg/head	Cows	Foll. Cows	Buff	Foll. Buff
El-Waqaff	2.19	800	2.17	543	1.37	685	N.A.	2.69	1.29	2.93	1.33
Qafft	1.20	655	1.14	285	1.11	553	3.48	5.17	1.71	5.17	1.79
Qana	1.50	720	1.00	250	1.14	568	4.68	3.99	0.97	4.00	0.99

* kirat: measurement of cultivated land in Egypt i.e. 1 kirat = 175 m^2
Foll: followers Buff. : Buffaloes

Table 6. Average daily consumption of winter green forage and dairy animals and concentrate for fattening animal/day in El-Waqaff, Qafft and Qana districts

	Alfalfa/farm/day		Berseem/farm/day		Fattening		Av. Conc. annual Price (L.E./ton)
	Kirat	Kg	Kirat	Kg	Kg conc./<300 kg BW	Kg conc./>300 kg BW	
El-Waqaff	2.91	727	3.33	1333	4.59	5.68	1077
Qafft	1.13	281	1.35	538	5.43	6.57	1156
Qana	0.67	167	1.26	505	4.50	5.67	1067

Results in table 5 and 6 showed that stocking rate in summer little bit lower than winter season in the three studied areas this might be attributed to that some farmers get red of some animals in summer because lack of cultivated green forage areas. By other meaning the green forage areas were given for AU in summer were higher than in winter for Qafft and Qana. While, El-Waqaff was lower this because the cultivated areas are bigger and the positive relationship between cultivates area and green forage area.

Ration given to fattening calves was based on their bodyweight, calves less than 300 kg got an average of 4.59, 5.43 and 4.50 kg concentrate/day in those three studied areas, while those above 300 kg got as an average of 5.68, 6.57 and 5.67 kg concentrate /day in the three areas, respectively. El-Sayes and El-Wardani (2004) found that in Ismalia, daily concentrate feeding ranged between 1.20 kg per animal in winter and 4.00 kg per animal in summer.

Milk production costs and revenue

Table (7) shows data of milk production cost and revenue in El-Waqaff, Qafft and Qana. El-Waqaff has the highest total milk production and daily milk yield for local cow compared to Qafft and Qana. The lactation length was the lowest in El-Waqaff while it was higher in Qafft and Qana, which had similar values. The variation among districts could be attributed to better farm management and efficient utilization of farm feeding resources. Farmers in El-Waqaff prefer raising local cows because of less daily feed cost since it was L.E. 6.97/day, compared with Qafft and Qana of L.E. 8.76/day and L.E.8.06/day, respectively. El-Sayes and El-Wardani (2004) reported that the average of daily milk yield for local cow in Ismalia was 4.10 kg/day and average of milk production was 858 kg per lactation. Daily milk revenue

minus feed cost was 23%, -0.04% and 04% for the three studied areas, respectively. Similar result was found by Khalil et al. (2005) Who reported that daily milk yield over feed cost in Ismalia was 24%. El-Waqaff has the best daily revenue from local cow while Qafft had losses from rearing local cows while Qana has the lowest profit from local cows.

Table 7. Average of lactation length, milk production cost and revenue per farm at El-Waqaff, Qafft and Qana districts

Trait	Local cow			Buffalo cow			Crossbred cow		
	El-Waqaff	Qafft	Qana	El-Waqaff	Qafft	Qana	El-Waqaff	Qafft	Qana
Av. (LL) (d)	186	197	197	240	232	208	256	248	256
(TMP) (kg)	837	835	809	1200	1172	1253	1645	1687	1612
Av. (TMR) (L.E.)	1591	1653	1660	3121	3165	3446	3127	3340	3305
(DMP) (kg)	4.50	4.23	4.10	5.00	5.05	6.02	6.42	6.79	6.29
Av. Price/kg milk (L.E)	1.90	1.98	2.05	2.60	2.70	2.75	1.90	1.98	2.05
(DMR) (L.E.)	8.55	8.37	8.41	13.00	13.64	16.56	12.20	13.44	12.89
(DFC) (L.E)	6.97	8.76	8.06	9.96	12.51	11.51	9.96	12.51	11.51
(MR%) - (FC)	23	-4	4	31	9	44	22	7	12

Calculated price was according to the price on 2007. Day (d), Average of lactation length (Avg. LL), Total milk production (TMP), daily milk production (DMP), average total milk revenue (TMR), daily milk revenue (DMR), daily feeding cost (DFC), milk revenue (MR), feeding cost (FC).

Buffalo milk production in the studied areas showed different results. Qana had the lowest lactation length while; it had the bigger quantity of daily milk production from buffaloes. The lactation length in El-Waqaff and Qafft was 240 and 232 days, respectively, while in Qana was 208 days. Average daily milk production was 5.00, 5.05 and 6.02 kg/day for the same studied areas, respectively. Total milk production was 1200, 1172 and 1253 kg/lactation. El-Ashmawy *et al.* (2006) who found that the average buffalo milk production and total milk production in small farms in west delta region was 6.20 kg/day and 1546 kg per lactation. Farmers in Qana are raising buffalo for milk production due to the high consumer desire and buffalo milk profitability compared with cows milk.

Average profit from buffalo milk Qana was the highest (44%) compared with EL-Waqaff and Qafft 31% and 9% respectively. Almost the similar results were found by Shelby *et al*. (2005) who found that buffalo milk revenue was 40% in Ismalia. In addition, Qana has some collection centres close to milk producers and this is the reason to explain that milk is easy to be market.

Qafft had the highest total milk production per lactation and daily milk yield for crossbred cows compared to El-Waqaff and Qana. The variation among the three districts could be attributed to that farmers applied some feeding technical packages (molasses, fenugreek as additives and green forage conservation), Besides, farmers at Qafft prefer the crossbred cows as they delivered healthy calves for fattening due to the availability of green forage and concentrate over the year. The highest daily feed cost was in Qafft. Although crossbred milk production at Qafft was the highest, milk revenue over feed cost was the lowest, this might be attributed to the higher availability of feed.

El-Sayes and El-Wardani (2004) reported that the average daily milk yield for crossbred cow in Ismalia was 6.50 kg/day it is close to three studied areas. But total milk production in Ismalia was 1911kg/lactation much higher than the studied areas. The big difference attributed to lactation length in Ismalia was 294 days while in studied areas were 256, 248 and 256 days, respectively.

Landholding and use pattern:

Percentage and cultivated area allocated for different crops during winter in the three studied areas are presented in Table (8). Farmers at El-Waqaff had larger farm size average (23.02 feddan.) than those at Qafft average (9.15 feddan) and Qana average (7.07 feddan). Farmers may attribute it to settlement ownership of the land after reclamation. Percentages of cultivated areas for green forage (berseem and alfalfa) were 33.66%, 31.80% and 25.46% of the farm size in El-Waqaff, Qafft and Qana, respectively.

Percentages of wheat cultivated areas were 17.42%, 21.09% and 27.58% of total winter areas in El-Waqaff, Qafft and Qana, respectively. The overall percentage of green forage area was 31.81% of the farm size in winter season. Farms in El-Waqaff, Qafft and Qana had allocated 35.10%, 25.36% and 14.43% for herbs cultivation in winter, respectively. The remaining land areas of 13.81%, 21.75% and 32.53% in the same three districts were used for vegetables.

The most important summer crop was green forage since farmers allocated ranged between (49.36% and 58.27%) of total cultivated area. The second important crop was maize the percentage of cultivated areas allocated for summer maize was 15.63% and 21.48%. The third important crop was tomato and farmers cultivated from 13.95 % to 20.52% of total areas in the corresponding districts.

Other crops included sugar cane which was only cultivated in El-Waqaff district with average proportion of 11.28%. Sesame was cultivated in El-Waqaff and Qana where the average proportions of cultivated area was 9.79% and 8.93% in El-Waqaff and Qana, respectively. The present study was focused on common dairy farms. The sugarcane was considered as one of the most important crop in Upper Egypt but it was not found in the most studied farms.

The average winter farm size was 23.02, 9.15 and 7.07 feddan per farm in El-Waqaff, Qafft and Qana, respectively. Average farm size was less in summer due to limited availability of water for irrigation adding that hot weather increases water evaporation. The results were in agreement with El-Sayes and El-Wardani (2004) who found that the average cultivated area in Ismailia and East Qantara districts, which have almost the same circumstance, were 9.07 and 7.56 feddan/farm.

The present study showed some differences between dairy farms in the same governorate. Some farmers had local cattle while others had crossbred animals or buffalo. Also the differences were found in crop rotation in type of crops between districts in the same governorate.

Table 8. Cultivated area under different crops per farm at El-Waqaff, Qafft and Qana

	Average farm size						Overall Mean	
	El-Waqaff		Qafft		Qana			
Types of crop in feddan	**Feddan**	**%**	**Feddan**	**%**	**Feddan**	**%**	**Feddan**	**%**
Wheat	4.01	17.42	1.93	21.09	1.95	27.58	2.63	20.11
Berseem	3.76	16.33	0.98	10.71	1.03	14.57	1.93	14.76
Alfalfa	3.99	17.33	1.93	21.09	0.77	10.89	2.23	17.05
Av. Winter Green forage	7.75	33.66	2.91	31.8	1.80	25.46	4.16	31.81
Fennel	4.58	19.90	0.34	3.72	0.00	0.00	1.64	12.54
Fenugreek	2.28	9.90	1.71	18.69	0.00	0.00	1.33	10.17
Aniseed	1.22	5.30	0.27	2.95	1.02	14.43	0.84	6.42
Herbs	8.08	35.1	2.32	25.36	1.02	14.43	3.81	29.13
Vegetable	3.18	13.81	1.99	21.75	2.3	32.53	2.49	19.03
Av. Winter Farm size	23.02	100	9.15	100	7.07	100	13.08	100
Summer Maize	3.16	15.63	1.57	21.48	0.97	16.99	1.90	17.31
Sorghum	3.74	18.50	1.56	21.34	1.51	26.49	2.27	20.47
Darawa	2.25	11.13	0.77	10.53	1.03	18.04	1.35	12.17
Alfalfa	3.99	19.73	1.93	26.4	0.77	13.49	2.23	20.11
Av. Summer Green forage	9.98	49.36	4.26	58.27	3.31	58.02	5.85	52.75
Tomato	2.82	13.95	1.5	20.52	0.92	16.11	1.75	15.78
Sugar cane	2.28	11.28	0.00	0.00	0.00	0.00	0.76	6.85
Sesame	1.98	9.79	0.00	0.00	0.51	8.93	0.83	7.48
Av. Summer farm size	20.22	100	7.31	100	5.71	100	11.09	100

CONCLUSION

The present study indicated that dairy farming systems in Upper Egypt had particular characteristics under mixed farming condition. For instance, farmers located in the adjacent back desert were characterized by large cultivated area mainly occupied by green forages and herbs. In addition, greater holding capacity of animals with tendency to breed local cows as well as smaller family size in comparison with farms located in the village. Application of AI in the valley districts enabled farmer

to raise more crossbred cattle and to produce milk for marketing in urban areas. Raising small ruminant was pronounced in the desert farms in valley areas.

Furthermore, crops and fodder crops production as well as animal productivity were greatly by several climatic conditions and availability of water. Therefore, it can be noticed the complementary and interdependency nature of the mixed farming system in these areas. Animal extension services, increased application of AI programme and conservation of green forges are important tools to upgrade animal productivity in the studied areas.

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خصائص نُظم مزارع إنتاج الألبان فى صعيد مصر

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أجريت الدراسة على ٩٧ مزرعة من مربى إنتاج الألبان تحت النظم المز رعية المختلطة (إنتاج حيواني/نباتي) وتم تقسيمهم إلى ثلاثة مراكز(الوقف ، قفط، قنا) تابعين لمحافظة قنا. أستخدم أسلوب العينة العمدية فى اختيار عينة الدراسة. تم تصميم استمارة استبيان تحتوى على كل البيانات التى تفي بغرض الدراسة وتم تجربتها على عدد محدود من المزارعين . ثم جمعت البيانات عن طريق المقابلة الشخصية وكان الهدف من الدراسة هو توصيف خصائص مزارع إنتاج الألبان لمعرفة المعوقات التى تعوق تنمية قطاع الألبان فى صعيد مصر ومن ذلك يمكن وضع توصيات لتطوير هذا القطاع .

وقد أوضحت النتائج أن متوسط حجم المزرعة فى الثلاثة مراكز هو ٢٣.٠٢و ٩.١٥و٧.٠٧ فدان على التوالي. وكانت عوائد البن مقسوما على مصاريف التغذية هو ١.٢٣% و ٠.٩٦% و ١.٠٤% للأبقار البلدية فى الثلاثة مراكز بينما كانت النسبة ١.٣١% و ١.٠٩% و ١.٤٤% للبن الجاموسى وكانت ١.٢٢% و ١.٠٧% و ١.١٢% للأبقار الخليط فى الثلاثة مراكز على التوالي.

أما عن تغذية الحيوان فكان متوسط استهلاك الحيوانات من الأعلاف الخضراء فى المزرعة فى موسم الصيف من الدراوة والبرسيم الحجازي هو ١.٣٧ و ٢.١٧ و ١.١١ قيراط دراوة وكانت ١.١٤ و ١.١٤ و ١.٠٠ قيراط برسيم حجازى فى الثلاثة مراكز على التوالى. فى موسم الشتاء كان متوسط استهلاك البرسيم ٣.٣٣ و ٢.٩١ و ١.٣٥ قيراط و ١.١٣ و ١.٢٦ ٠.٦٧ قيراط برسيم حجازي لنفس المراكز على الترتيب.

متوسط إنتاج اللبن فى الثلاثة مراكز كان ٤.٥٠ و ٥.٠٠ و ٦.٤٢ كجم/يوم فى مركز الوقف للثلاثة أنواع الحلابة البلدى والجاموس والخليط. وكانت ٤.٢٣و ٥.٠٥و ٦.٧٩لمركز فقط و كانت ٤.١٠و ٦.٠٢ ٦.٢٩ كجم/ يوم لمركز قنا وأستخدم التحليل لإحصائي فى ثلاث نماذج توضح تأثير كل من المراكز والنوع وعدد العشر وموسم التلقيح على إنتاج اللبن ثم نموذج ثانى يوضح تأثير كل من المراكز وحجم المزرعة وعدد الوحدات الحيوانية على المساحة العلفية بالمزرعة والنموذج الإحصائي الثالث كان لمعرفة تأثير كل من المراكز وحجم المزرعة على حيازة الأبقار الحلابة.

بصف عامة يوصى بالآتي:

– إستخدام بعض التكنولوجيا البسيطة الغير مكلفة يمكن أن تزيد من الإنتاج الحيواني مثل حفظ الأعلاف الخضراء أستخدام التلقيح الصناعى ، بعض الإضافات الغذائية مثل المولاس و النباتات الطبية.