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Descriptive Study for Farming Systems under Environmental Conditions in North of Delta and Middle Egypt

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ABESTRACT

The main objective of this study is to describe and characterize farming systems and type of farms for ruminants under the environmental conditions in North of Delta (Kafr El-Sheikh, G1) and Middle Egypt (Bani - Swef, G2) governorates. Data were collected through visiting seven districts within each governorate. Randomly chosen 10 villages in each district. The visits were monthly and the study period was from December, 2013 to June, 2015. Data collected included type of farms, number of farm animals in each farm, feeding systems followed in winter and summer. Also, air temperature (AT C°) and relative humidity (RH %) were recording to calculate temperature humidity index (THI). Type of farms surveyed under study were classified to, smallholder (SHF), special farm (SF) and governmental farm (GF). Production system of farms were classified to three categories, milk production, and meat production and mixed of milk and meat production. The system of farms were described depending on farm animal as cows only, buffaloes only, mixed of cows and buffaloes, mixed from large ruminants as cows with small ruminants (sheep and goats) or buffaloes with small ruminants (sheep and goats). The number of farms own agricultural tenure were recorded and the percentages of these farms were 57% and 49% in G1 and G2, respectively with least squares means of 12.61±5.5 and 8.91± 6.52 Fadden., Results revealed that climatic conditions was better in middle Egypt than in north of Delta because of the low THI. Also, number of animals and number of smallholders were larger in G2 compared with G1. Small holder's percentages were 66.67% and 74.42% of the total surveyed farms in G1 and G2, respectively. Special farms percentages were 28.57% and 20.93% of the total farms in G1 and G2 in G1 and G2, respectively. The governmental farms had the lowest percentages, 4.76% and 4.65%, respectively. The number of dairy farms in G1 was higher than in G2. The fattening farms and farms of both milk and meat production were higher in G2 compared with G1. Farms of G2 depended on family labor with percentage of 57.14%, on family with help of hired labor with 19.05% and on hired labor only with 23.81%. The percentages in G1 were 45%, 12.5% and 42.5%, respectively. The most used feeding system was system (4) which includes combination of green, roughages and concentrates with percentages of 64.1% and 67.7% in winter for G1 and G2, respectively and with 66.7% and 64.7% in summer season, respectively. While the lowest system in winter was system (2), (roughages and concentrates) with 7.7% and 2.9% in G1 and G2, respectively, the lowest system used in summer was system (1) for G1 (5.1%, for green and concentrates) and system (2) for G2 (8.8%, for rough and concentrates), respectively. It is conclude that the climatic conditions in G2 best than G1 due to lower of THI in G2 that reflects of numbers the fattening farms and mixed frames (milking and fattening) were more in G2 compared with G1., Feeding and workers under G2 conditions lower of costs of compared with G1 due to depended on green forage in feeding and the workers from family .The recommendation increased farms of animal production under conditions in Middle Egypt (G2).

Keywords: Temperature Humidity Index (THI), Smallholders, Farming system, Feeding system, workers, Middle Egypt, North of Delta.

INTRODUCTION

Environmental variables, such as ambient temperature, humidity, air movement and solar radiation combine to reach values that surpass the upper limit of the thermo neutral zone, animal enter a condition known as heat stress. Heat stress influences the performance of animal by reducing feed intake, feed efficiency, feed utilization and more activation to the normal thermoregulation reaction i.e. respiration rate, sweating and rectal temperature, causing disturbances in the metabolism (increased water intake and body water content) (Ashour and Shafie 1992, Ashour *et. al*., 2007 and Omran *et. al.,* a & b 2019).

With climatic change warm and humid conditions cause heat stress gradually, which affects behavior and metabolic, feed nutrient utilization and feed intake., Livestock have several nutrient requirements including energy, protein, minerals, and vitamins, which are dependent on the region and type of animal (Thornton *et. al*., 2009 and Omran *et al.,* 2011) Sodium and potassium deficiencies under heat stress may induce metabolic alkalosis in dairy cattle, increasing respiration rates (Chase, 2012). Quantity and quality of feed will be affected mainly due to an increase in atmospheric CO2 levels and temperature (Chapman *et. al*., 2012).

Khalil and Omran (2018) reported that impact of climatic change on temperature humidity index (THI) values in different three regions (Lower of Egypt, Middle of Egypt and Upper of Egypt) during the period from 2016 up to 2060 gives evidence for significant changes in THI values during the period from 2046 to 2060, The classifications of THI during the study period found that the moderate class shows significant gradual increase with time in all studied (12 governorates) and none stress percentage tends to decrease in all governorates to the account of increasing the mild and moderate classes.

The main problem to improve animal production is animal feed which is not efficiently utilized in Egypt. In the winter there is a surplus of green forage over the animal feed requirements while in the summer there is shortage Hathout *et. al.* (1996), Nutrition represent 70% of animal production costs, the main problem to improve animal production is with animal feed which is not efficiency utilized , in winter there is a surplus of green forage over the animal feed requirements while in summer a shortage is found. Addition, the concentrates are expensive, where most farmers cannot have enough money to buy it. Moreover, there is great competition between cash crops and green fodders for cultivated area (General Statistics Year book2005). Then system of nutrition different from regain to another regain effects of type of animals and production. The main object of this study is to characterize and compare feeding system and type of farms and labors under environmental condition in North of Delta and Middle Egypt regions.

MATERIALS AND METHODS

The present study was connected in two Governorates in Egypt the first in North of Delta (Kafer El-Sheahk Governorate, G1) and the second in middle Egypt (Beni-Suef Governorate, G2). Data were collected from the seven districts within each Governorate. Each district visited 10 villages. The visit was monthly, the study period was from December (2013) to June (2015). The main values of agricultural tenure in Kafer El-Sheahk & Beni-Suef Governorates 12.61±5.50 & 8.91± 6.62/ Fadden (F). The place of animal houses, between inside farmer house, middle of cultivated area, new reclaimed area and next to canals or fish farm. The numbers of observed (419) in G2 and (242) in G1. Three types of farms detected; governmental farm (GF) & special farm (SF) or smallholder (SH F).

System of production were recorded as meat production only or milk production only and mixed of both meat and milk production. Agricultural tenure was recorded for each farm if available. Also, farms were classified depended on animal species where some own Buffaloes only, Cows only, Mixed from large and small ruminants,(Cows, Sheep's and Goats) and (buffaloes , sheep and goats). Feeding were either concentration, roughage feed, green feed, mixture, feeding in winter was a combination between some of berseem, wheat, bean, onion, potatoes, vegetables, fenugreek, fennel, aniseed and fodder beet In summer was maize, cotton, rice, darawa, kidney bean, peanuts ,elephant grass, watermelon, sorghum, alfa alfa, tomato and vegetables.

The number of feeding animals per day ranged between two, three. The workers were categories, family only, hired labor or both, drinking water source (spigot, canal, well) Also to recording air temperature (AT, °C) and relative humidity (RH, %) to calculated temperature humidity index (THI) by using equation of Mader *et. al.* (2006) as following :

$$THI = (0.8 \times T) + ((RH/100) \times (T-14.4)) + 46.4$$

Where: T is air temperate (°C), RH is relative humidity (%).

The visits are recorded using GPS for mapping Possible.

Number of animals in each governorate were transferred to animal units to apply factors represent animals per farm using the weighting factors calculated by soliman *et al,* (1982). Descriptive statistics, levels of\ significance and least squares means were carried out using the Statistical Analysis system (SAS, 2002).

RESULTS AND DISCUSSION

Table (1) Shown main ± SE for classification of Temperature humidity index THI according physiological reaction for animals in North of Delta (Kafer El- Sheakh Governorate, G1) and Middle of Egypt (Beni-Suef Governorate, G2). Found that values of THI were higher in G1 compared with G2 and severe heat stress under conditions in G2 mostly equal moderate heat stress under conditions in G1.

The relative humidity (RH%) under climatic conditions of North of Delta was playing important role of increased values of THI as micro-environmental conditions around animals and this reflected of physiological and productive performance of animals. Temperature-humidity index (THI) is still the best, simplest and most practical index for measuring environmental warmth which causes heat stress in dairy cattle and physiological parameters must always be used together to determine and evaluate heat stress in dairy cattle. In addition, THI offers a method of combining two of the more important and easily measured weather factors into a possible measure to compare temperature and humidity data and animal response at different climatic zones and locations Du Preez (2000).

Table 1. Mean ± SE classification of Temperature humidity index (THI) recording physiological responses for animal in North of Delta (Kafer El-Sheakh Governorate, G1) and Middle of Egypt (Beni-Suef Governorate, G2).

Classification (THI)	G1	G2
Thermo-neutral	67.12±0.15	65.08±0.19
Mild heat stress	77.12±0.17	71.28±0.13
Moderate heat stress	86.68±0.10	84.38±0.10
Severe heat stress	89.97±0.07	87.45±0.07

Any improved animal index will ideally be useful as a base for continued development of biologic response function and representative of consequences resulting from primary factors influencing energy exchange between the animal and its surrounding Omran and Fooda (2013), and Hahn *et. al.* (2003).

Table (2) presented number of animal types expressed as animal units (AU) and percentage of each type AU under the productive conditions in both governorates, Kafer El-Sheikh and Bani -Swef. The number of livestock owned per farm varies according to farm size and farmer's facilities. To make easy comparison in number and percentages of farm animals, a method of Soliman *et. al.* (1982) was followed to calculate standardized animal units (AU) by assigning each type a specific weighting factor. It was found that the numbers of AU and percentage of buffaloes were higher in G1 than in G2, the percentage were (62.96% and 7.7%), respectively, while number of cows was higher in G2 than in G1, (91.23% and 34.33%), respectively.

The high percentage of buffaloes in G1 refers to the presence of the governmental farm of Mahlet Mousa in G1 which is the biggest buffalo farm in G1. Sheep and goats numbers in G1 are higher than in G2. These results are in agreement with those reported in General Statistics Year Book (2017), Soliman *et. al.* (1982), Nigm (1996) and Shalaby *et. al.* (2005) they reported that, large farms tend to favors cattle over buffaloes. Number of animals surveyed in general was higher in G2 compared with G1. This may be due to the natural conditions in G2 where about 57.24 % of farmers surveyed in G2, Table (4), depended on family to work which is more than in G1, in addition, the availability of field residuals. Climatic conditions in G2 was better than in G1 due to lower THI in G2, Table (1) that could reflects on animal performance and higher number of animals, Table (2).

Table 2. Number of animal types expressed as animal units (AU) and percentage of each type AU under productive conditions of G1 and G2 governorates.

Type of animal	G1			G2			Total	
	N	AU	AU %	N	AU	AU %	N	AU
Buffaloes	1057	1002.10	62.96	396	373.10	7.7	1453	1375
Cows	706	546.45	34.33	5112	4418.0	91.23	5818	4964.5
Sheep	148	29.60	1.86	188	37.60	0.78	336	67.2
Goat	90	13.50	0.85	184	14.10	0.29	274	27.6
Total	2001	1591.65	100	5880	4842.80	100	7881	6434.3

G1: Kafr-Elsheikh governorate G2: Bany-Swef governorate.

Table (3) shows number and percentage of farm system (smallholder (SHF), special farm (SF), and governmental farm (GF) and type of production system (milk, meat and both) under productive conditions in G1 and G2 governorates. The number of smallholder farms in G2 was higher than in G1 and the percentage were (74.42% and 66.67%) respectively.

The special farm numbers were higher in G1 compared with G2 where the percentage were (28.57% and 20.93), respectively due to depended on technology in feeding and another production in farm with animal production to depressed in income and increased in outcome. The governmental farms were almost the same percentage in both of the two governorates. These results reflect the existing farmers' preference and facilities in the two governorates. Smallholder farms, in feeding routine depended on residuals of land and these crops for home consumption. This helps good feeding practices in G2.

Abdel-Aziz (1992) mentioned that about 95% of buffaloes and cows populations are available in farm of less than 5 feddans and five heads. Ahmed *et. al.* (2002) reported that under commercial dairy production system feeding costs accounted to 87-90% from total variable costs. Sammour (2002) reported that using berseem silage in some dairy animal fodder decreased the feeding costs by 0.64 L.E/head/day.

Shalaby *et. al.* (2005) reported that labor cost contributed around 20% of total costs. Special farms used to use many new technologies to increase income which is available more in G1, while under G2 conditions, mostly all smallholder breeders did not have the ability to spend for technology and because of the lower number of animals with small agricultural tenure.

Table 3. Type, numbers of farms (governmental (GF), special farms (SF) and small holder farms, (SHF) and type of production (milk production, meat production and both of them) in G1 and G2.

Farm Type	G1		G2	
	N	%	N	%
SHF	28	66.67	32	74.42
SF	12	28.57	9	20.93
GF	2	4.76	2	4.65
Total	42	100	43	100
Milk	17	44.74	11	27.50
Meat	7	18.42	9	22.50
Milk and meat	14	36.84	20	50.00
Total	38	100	40	100

G1: Kafr-Elsheikh governorate G2: Bany-Swef governorate.

While the number of dairy farms in G1 was higher, Table (3) than in G2, the percentage were 44.74 and 27.50, respectively, the number of fattening farms and mixed milk and meat farms were higher in G2 compared with G1, this results due to the first , environmental conditions in G2 THI was lowers and best to fattening animal, the heat energy was higher and mead load on fattening animal from beginning production to slaughtered., while the milking animals the heat energy after milking reduces heat energy on animals., added to dairy farms needed to more many and using technology for production gives breeder ideal income.

Baile and Forbes (1974) reported that the reduced feed intake in summer is due to direct of elevated temperature on the appetite center in the hypothalamus ventromedial nucleus resulting in reduction of the production of VFA which are the main energy source in ruminants. Nanga and Gary (1992) reported that the voluntary feed intake during months of higher air temperature was reduced to 40% as compared to that consumed during cooler months. Omran (1999) reported that constant heat stress in lab at 40c increased water consumption per metabolic body weight MBW0.75 by 16% in buffalo calves and 25% in Friesian calves, Also reported that the concentrate intake was reduced by 20% in buffalo and 18%in Friesian caws and reduced the average daily gain (ADG/kg) by 25% in buffalo calves and 20% in Frisian calves.

Table (4) shows classifications of farm system according to animal species and type of human labor in the farms. Type of farms were cows only, buffaloes only, mixed cows and buffaloes only or mixed large and small ruminants (buffalos and/or cows with sheep and goats). The highest percentage of farms in G1 was for buffaloes and cows only type, (40.48%) and the lowest was for mixed large and small ruminants (7.14%). The farms included mixture of cows, buffaloes and small ruminants in G2 had the highest percentages of farm types (31.71%), followed by cows only type (29.27%).

Table 4. Numbers and percentages of systems of farming type in G1 and G2.

Type of system	G1		G2	
	N	%	N	%
Buffaloes only	1	2.38	3	7.32
Cows only	7	16.67	12	29.27
Mixture large (buffaloes and cows) with small ruminants	11	26.19	13	31.71
Buffalo and cows only	17	40.48	8	19.50
Buffaloes, sheep and goats	3	7.14	1	2.44
Cows, sheep and goats	3	7.14	4	9.76
Labor	N	%	N	%
Family only	18	45.0	24	57.14
Hired	17	42.5	10	23.81
Family and hired	5	12.5	8	19.05

G1: Kafr-Elsheikh governorate G2: Bany-Swef governorate.

Labors were classified into family only, hired workers or both. Smallholder producers play an important role in animal production sector, since over 66.67 % of G1 farms and 74.42% of G2 farms were for small holders, Table (3). Dairy production in this context is to be a subsystem of farming system, in which dairy and crops production are associated and mutually beneficial. Also,

the individual landholding allows the opportunities to improve feed production in the form of forage cultivation, planting of fodder crops and utilization of crop residues.

Farms of G2 depend mainly on family labors, (57.14%), Table (4), which is more than in G1, 45%. This result is associated with the results mentioned in Table (3), which was that small holders in G2 were higher in numbers than in G1, also, it expressed the difference in social status and culture in the two governorates. This result is also in good agreement with Hanaa Kheir-El-Din and Heba El-Laithy, (2008) who reported that, approximately 39% of farmers in Lower Egypt are family workers whereas, they represent an even bigger percentage in Upper Egypt, reaching 46 % of labor. Number and percentage of hired labor were higher in G1, (42.5%) which is almost equal to the family labor, (45.0%) in the same governorate.

The farming system between mixed farms (buffaloes only or cows only) and system produced both crop and livestock to valuable food for animals to reduce costs of production. Gryseels (1988) reported that the individual landholding allows the opportunities to improve feed production in the form of forage cultivation, planting of fodder crops and utilization of crop residues.

Smallholder dairy production can be improved without affecting the primary function of animals and could be attractive in the mixed farming system as it offers the opportunity to diversify operations, spreads risk and provides regular income .,Productive performance is the most important index out of various indices of animals adaptability to environmental conditions, among these indices, production (milk and meat). This index is the outcome of water and feed intake behavior, which is affected, greatly by stress factors mainly that of climatic and nutritional conditions.

Type of worker: the depended on family worker only more in G2 than G1 the percentage were (57.24%&45.0%) and number was as trends depended on (family and rented worker) the percentage were (12.5%& 19.05%) respectively. but number of rented worker only G2 more than G1, the percentage were (42.5% & 23.81%) respectively. All results indicator to direction the breeder animals in G2 because to lower of costs of production, more problem of animal production feeding and worker inG2 no problem in two factors under condition in G1.

Gryseels, (1988) reported that 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. Trend this study indicated that mixed farming system under environmental condition in middle Egypt to suitable condition of breeder incomes and needed to cash money to dally requirements and climate condition best to production without higher risk. El-Ashmawy et., al(2006) reported that the best economic efficiency was realized in large dairy farms for crossbreed and local cows., added for buffaloes in medium dairy farms showed the best net revenue compared with cross and local cows .

Table (5) displays the number of farms surveyed in each governorate which have an agricultural tenure with the least squares means in Feddan. The least squares means of agricultural tenure in Kafer El-Sheikh and Bani-Swef governorates were 12.61±5.50 and 8.91± 6.5 2 Fadden, respectively, with non -significant difference between the two governorates. As shown in Table (5), 57% of the farms in G1 have an agricultural tenure and for G2, there were only 49% of the farms.

Table 5. Least squares means (LSMeans) ± standard errors (Stderr) of agricultural tenure and number of farms in G1 and G2.

Governorate	No of farms with tenure	%	LSMeans ± Stderr / Feddan	No of farms without tenure	Total number
G1	24	57.00	12.61±5.50	18	42
G2	21	49.00	8.91± 6.°2	22	43

G1: Kafr-Elsheikh governorate G2: Bany-Swef governorate.

Gryseels (1988) reported that most Egyptian farmers practice mixed farming system (crop and livestock) and animal feeding quality is the main constraint faced farmers. Smallholders' dairy production can be improved without affecting the primary function of animals and could be attractive in the mixed farming system, spreads risk and provides regular income.

Table (6) shows the classification of feeding combinations (systems) as farmers provide to the farm animals. First, in winter there is plenty of berseem and green forages, so the first category was berseem, green forages and concentrates, system (1). System (2) was roughages and concentrates, system (3) was green forages and roughages and system (4) was green forages, roughages and concentrates.

Table (6) illustrates using the different systems in the winter and the summer in Kafer El-Sheikh and Bani-Swef governorates.

Table 6. Feeding systems in winter and summer seasons of farms surveyed in G1 and G2.

System of feeding	Winter				Summer			
	G1		G2		G1		G2	
	N	%	N	%	N	%	N	%
Ber+Green+Conc (1)	4	10.3	7	20.6	2	5.1	5	14.7
Rough+Conc (2)	3	7.7	1	2.9	5	12.8	3	8.8
Green+Rough (3)	7	17.9	3	8.8	6	15.4	4	11.8
Green+Rough+Conc (4)	25	64.1	23	67.7	26	66.7	22	64.7

Ber: Berseem Green: Green forages Conc: Concentrates Rough: Roughages

In winter, it was found that the higher system to be using was system (4) in the two governorates. The percentages were 64.1 % and 67.7 % in G1 and G2, respectively. The lower system to be using was system (2) in the two governorates, where the percentages were 7.7% and 2.9% in G1 and G2, respectively. On the other hand, system (1) was used in G2, almost double the percentage of using in G1, the percentages respectively were (20.6% and 10.3%). It was also realized that system (3) was used in G1 almost double than in G2, the percentage were (17.9% and 8.8%), respectively. These percentages may explain the nature of production system for some breeders in both governorates.

In summer season, it was found that, the higher system to be used was system (4) in the two governorates. The percentages were (66.7% and 64.7%) in G1 and G2, respectively. While system (1) seemed to be suitable under G2 conditions, (14.7%), it was with lower percentages

under G1 conditions, (5.1%). The lower system used in G2 was system (2), (8.8%), and this may be due to the highly costs of concentrates compared with breeder incomes. Higher poverty rates in the south of Egypt than in lower rural Egypt were reported by Hanaa Kheir-El-Din and Heba El-Laithy, (2008). The percentages of using system (3) under the two governorates conditions were close, the percentages were (15.4% and 11.8%), respectively in the two governorates. The availability of the green forages in the governmental farms starts in July, this may explain the availability of green forages in summer making system (4) is the highest.

Hathout *et. al.* (1996) reported that, the concentrates are expensive where most farmers cannot afford it. Moreover, there is always competition for cultivated area between cash crops on one hand (corn, rice, bean and wheat) and green fodders on the other hand. The effects of climate change on quantity and quality of feeds are dependent on location, livestock system, and species (IFAD, 2010). Temperature increase may increase lignin and cell wall components in plants (Polley *et. al*., 2013; Sanz-Saez *et. al.*, 2012), which reduce digestibility and degradation rates (IFAD, 2010; Polley *et. al.*, 2013), leading to a decrease in nutrient availability for livestock (Thornton *et. al.*, 2009).

Heat stress decreases forage intake, milk production, the efficiency of feed conversion, and performance (Haun, 1997; McDowell, 1968; Wyman *et. al*, (1962). El-Wardani *et. al.* (2005) reported that unbalances in feed requirement during winter and summer have direct impact on productive and reproductive performance of dairy animals.

CONCLUSION

It is concluded that the climatic conditions in G2 were better than in G1 due to lower of THI in G2 (decreased of RH%) that reflected on numbers of the fattening farms and mixed (milking and fattening) were more in G2 compared with G1. Feeding and workers under G2 conditions had lower costs compared with G1 due to depending on green forage in feeding and the workers from family. The recommendation is to increase farms of animal production under conditions in Middle Egypt (G2).

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دراسه توصيفيه للنظم المزرعيه تحت الظروف البيئيه فى شمال الدلتا ومصر الوسطى

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تهدف هذه الدراسه الى توصيف للنظم المزرعيه تحت ا لظروف البيئيه فى شمال الدلتا ومصر الوسطى محافظه كفر الشيخ ممثله لاقليم شمال الدلتا بينما كانت محافظه بنى سويف ممثله لاقليم مصر الوسطى. تم زياره سبع مراكز فى كل محافظه وداخل كل مركز زياره عشر قرى تم اختيارها بطريقه عشوائيه. إستمرت الزيارات شهريا من ديسمبر ٢٠١٣ الى يونيه ٢٠١٥ , تم تقسيم توصيف طبيعة المزارع إلى ٣ فئات هي صغار المربين ، مزارع خاصة و مزارع حكومية. و تم تقسيم طبيعة الإنتاج في المزرعة إلى إنتاج لبن ، انتاج لحم أو انتاج لبن ولحم معا. كذلك تم تقسيم حيوانات المزرعة إلى مزرعة تحتوي على أبقار فقط أو جاموس فقط أو أبقار وجاموس أو خليط من أحد المجترات الكبيرة مع أغنام وماعز.تم رصد عدد المزارع التي لها حيازة زراعية و كانت نسبتها ٥٧% و ٤٩% بمحافظتى كفر الشيخ و بني سويف على التوالي بمتوسط ١٢.٦١±٥.٥٠ فدان و ٨.٩١ ±٦.٥٢ فدان للمحافظتين على التوالي. واظهرت النتائج ان الظروف المناخيه كانت افضل فى مصر الوسطى لانخفاض دليل الحراره والرطوبه .وأيضا كان عدد الحيوانات وكذالك عدد صغار المربين كان اعلى فى مصر الوسطى مقارنه بشمال الدلتا. أظهرت الدراسة أن صغار المربين في القرى تحت الدراسة بلغت نسبتهم ٦٦.٦٧% و ٧٤.٤٢% من إجمالي المزارع تحت الدراسة في محافظتى كفر الشيخ و بني سويف على التوالي. وبلغت نسبة المزارع الخاصة ٢٨.٥٧% و ٢٠.٩٣% من الإجمالي على التوالي. أما بالنسبة للمزارع الحكومية فقد كانت أقل النسب ٤.٧٦% و ٤.٦٥ % على التوالي. كان عدد مزارع الألبان والتسمين كانت اعلى فى مصر الوسطى . وأوضحت النتائج أن اعتماد المزارع بمحافظة بني سويف على العمالة العائلية تبلغ نسبتها ٥٧.١٤% و اعتمادها على العمالة العائلية بمساعدة بعض العمالة المستأجرة ١٩.٠٥% و بينما الاعتماد على العمالة المستأجرة فقط نسبة ٢٣.٨١%. أما بمحافظة كفر الشيخ فكانت النسب ٤٥% و ١٢.٥% و ٤٢.٥% على التوالي. أما بالنسبة للتغذية فكانت أعلى نسبة لخليط كل من الاعلاف الخضراء و الجافة والمركزة (النموذج الرابع) بنسبة ٦٤.١% و ٦٧.٧% شتاء لمحافظتي كفر الشيخ و بني سويف على التوالي و صيفا بنسبة ٦٦.٧% و ٦٤.٧% على التوالي. أما أقل نسبة فكانت شتاء لخليط الأعلاف الخشنة والمركزة دون ادخال عليقة خضراء (النموذج الثاني) و كانت النسب ٧.٧% و ٢.٩% شتاء للمحافظتين على التوالي. اما صيفا فكانت أقل نسبة ٥.١% بمحافظة كفر الشيخ لتقديم الأعلاف الخضراء مع المركزة دون الأعلاف الخشنة (النموذج الأول) و بالنسبة لمحافظة بني سويف فكانت أقل نسبة ٨.٨% للأعلاف الخشنة مع المركزة دون أعلاف خضراء (النموذج الثاني). الخلاصه ان الظروف البيئيه فى مصر الوسطى افضل مقارنه بشمال الدلتا نتيجه لانخفاض دليل الحراره والرطوبه وهذا ينعكس على زياده اعداد مزارع التسمين وكذالك المزارع المخطلته الانتاج (اللبن واللحم) فى مصر الوسطى مقارنه بشمال الدلتا. بالاضافه الى تكلفه الانتاج من التغذيه والعماله تحت ظروف مصر الوسطى كانت اقل من شمال الدلتا للاعتماد على مخلفات المحاصيل الحقليه والعماله العائليه. اخيرا نوصى بزياده مزارع الانتاج الحيوانى تحت ظروف مصر الوسطى .