BENHA UNIVERSITY
FACULTY OF VETERINARY MEDICINE

BENHA VETERINARY MEDICAL JOURNAL

EFFECT OF CALVING INTERVAL, DAYS OPEN AND DRY PERIOD ON DAIRY FARM PROFIT

Sosa, G.A.[a]; Atallah, S.T[b], Liza S. Reda[a]
** Fac. of Vet,. Medicine Benha Univ.,**Fac. of Vet. Med. Alex. Univ.*

A B S T R A C T

The present study aimed to determine the effect of calving interval, days open and dry period on the reproductive, productive and economic efficiency of dairy farms under Egyptian conditions. This study was carried out through field survey in different regions of Egypt include (Menofia, Kaliobeia and El Giza province) during the period extended from May 2009 to October 2011 on random samples of dairy production sectors. These sectors were individual Farmers (Fallah), Private farms and Governmental farms. The dairy breeds included in this study were Balady (local breed), Holstein-Friesian (exotic breed), and Cross-bred (Balady X Friesian). The reproductive, productive and economic data were collected from a cross-sectional and longitudinal and field survey. the value of total return and net profit differ significantly at (P<0.01) among different breeds the higher value found Holstein Friesian (35962.80 and 20968.40 LE respectively) within days open range of ≤80-90 day and lower value found in Balady breed (7336.91 and 2697.54 LE, respectively) within days open range of ≤80-90 day this due to Holstein high producing with days open ≤ 80-90 day lead to length of lactation to be(305 day) and dry period to be 60 day which is regarded as standard lactation length while in Balady breed low production per day and short lactation length. Also, the value of total return and net profit differ significantly at (P<0.01) among different breeds the higher value observed in Holstein Friesian (36882.30 and 19641.87 LE, respectively) within range of 61-90 day and lower value of net profit found in Balady breed (2109.63LE) within range of 61-90 day and lower value of total return found in Balady breed (6449.57 LE) within range of ≤30 -60 day, also this results indicated that the different breeds of cattle had significant (P<0.05) effect on average total return, as, higher net return found in Holstein and lower in Balady breed in Balady breed. The higher total return and net profit value observed in Holstein Friesian (36310.00 and 21459.14 LE, respectively) within range of ≤ 365-395 day while lower value of net profit found in cross breed (1348.32 LE) within range of calving interval (457-550 day). The obtained result concluded that, the breed, days open, dry period and calving interval of great economic effect on profitability of dairy farms and its economic efficiency. The longer dry period, more than 61 – 90 day; days open more than 80 – 90 days and the longer calving interval more than 365 – 395 days causes decreasing the total returns and increasing production costs with lowering the net profits

KEY WORDS: Calving, Cattle, Days Open, Dry period

(BVMJ 23(1): 94-108; 2012**)**

1. INTRODUCTION

Reproductive efficiency is defined as the ability of a dairy producer to get cows bred back rapidly after calving with a minimum number of breeding per cow. The reproductive efficiency improvement causes increasing milk production so lead to increase profit and all lead to increase economic and productive efficiency this done through improvement reproductive efficiency parameters that include calving interval , days open and dry period [37, 50]. Variables used to denote the fertility of a dairy cow are calving interval (CI), days

open (DO), gestation length (GL), dry period (DP) and number of inseminations per pregnancy. CI defined as the number of days between the two successive calving. [33, 35, 46]. The most important factors affecting economic and productive efficiency includes Calving interval (CI), Day open and days dry. Calving intervals significantly (P<0.05) affect lactation milk yield, where the maximum milk yield of about 5493.33 kg following calving interval of 500 days [32, 45]. However, the lowest milk yields of 2677.40 kg following 550 days calving interval. Poor reproductive efficiency resulting in longer subsequent calving interval (CI) results in lower annual milk yield due to slippage in calving to less profitable months, fewer calves sold per year, increased number of services per cow, extra veterinary treatments and increased costs through longer dry periods [16]. In addition, Voore and Saveli [48] reported that mean value of days open (88 d) and calving interval (373 d) and Cilek [15] reported that an average calving interval 408.52 days observed. Cilek [15] found that, increased milk production and prolonged calving interval, Highest milk production (7604 kg) on standardized 1st lactation for cows with longest calving interval in compare to cows with shortest calving interval (7079 kg). Positive significant correlation (0.56775, *P<0.0001*) was found between standardized milk production and calving interval. [40]. While, De vries *et al*. [18] reported that extending the CI from 395 days to 432 days for instance results in a loss of Euro 2.08 per cow per day; in total Euro 77 per cow (37 days). Lyimo, *et al*. [32] recorded significant (P<0.05) effect of days open on lactation milk yield differed among different service period classes with the optimum service period of about 190 days for maximum milk production (5571.75 kg). Barozai *et al*. [12] used to identify and quantify the effect of factors influencing days open. Parity and the presence of uterine infection, cystic ovarian disease, mastitis and lameness were positively associated with days open. The proportion of variance explained at the herd level was 0.33% suggesting that the herds that participated in this study were relatively homogenous in the distribution of unmeasured herd-level factors influencing days open. Also Contreras *et al*. [16] reported that, cows calving in the summer had the greatest number of days open and those calving in the winter (January to march) had the fewest days open. The significant difference in days open between herds was related to difference in management such as nutrition, health and ability of farmers to detect heat signs after calving. There are many diseases affecting dairy animals affecting days open and causes prolonged days open [34 and 12] where they reported that, Cystic ovarian disease was time dependent and its negative effect decreased if cystic ovarian disease occurs later postpartum. Also, Days open are also reported to increase with reproductive disease. and lameness .a study found that lame cows had calving to conception interval's 40 days longer than healthy cows. The mean days dry was 104 days in Holstein Friesian cows [1]. However the maximum milk production could be attained if dry period 91 – 110 days [5]. While both short and long dry period affect profitability and recommended the dry period between 40-70 days for cows [43]. Bachman *et al*, and Halasa *et al*. [10, 28] indicated that a dry period (DP) of 30 days is sufficient to maintain milk. However, most of the literature indicated that a DP of 40 to 60 days is needed to achieve maximum milk yield during the following lactation [11]. Nevertheless, a shortened DP seemed to reduce milk production in primiparous, but not multiparous, cows. Cows with a short dry period during their second gestation produced 89.1% as much milk as cows with a 60 d dry period and that cows in their third or greater gestation produced 95.1% as much milk as cows with a 60 d dry period [7, 41, 13]. This study aimed to

determine the effect of calving interval, day's open and dry period on the reproductive, productive and economic efficiency of the dairy farms under Egyptian conditions.

2. MATERIALS AND METHODS

This study was carried out through field survey in different regions of Egypt include (Menofia ,Kaliobia , and El Giza) province during the period extended from summer 2009 to winter 2011 on random samples of dairy production sectors. These sectors were Farmers (Fallah), Private and Governmental. The dairy breeds included in this study were 1- Balady (local breed), 2-German Friesian (imported from Germany) fed on silage and concentrate ration composed of different amount of (concentrates, corn, salts etc), small herd size an low production in comparison to group 2. 3-Holstein Friesian (imported from America (united state) fed on total mixed ration (based on dry mater intake 60%concentrate and 40% forage) large herd size an high production in comparison to group14- Cross-bred (Balady X Friesian).

Data collection: The data were collected from a cross-sectional and longitudinal field survey. During the data collection, the researcher was in intimate contact with the dairy holders and managers. The dairy farms were visited two times at least, once in summer and the other in winter according to French and Nebel [23].

The data were collected by two methods as established by Overton [38] and Lateef [31]

a) From the accurate records which available in dairy farms of the study areas.
b) From the structured questionnaire method which established by the researcher in accordance with objectives of this study and admitted to the dairy holders and managers during the time of interview.

The collected data (raw data) were milk production records and accompanying reproduction records. This data was classified into different parameters to evaluate the economic, productive and reproductive efficiencies of dairy cattle. The data were classified into:

Productive and managemental data: That included, herd size, types of reared breed (Balady, Cross, Holstein-Friesian), parity "lactation number" (1, 2, 3, 4, 5, 6, 7, etc……, production sectors (Fallah, Private and Government), calving season (summer and winter), daily milk yield/kg, annual milk yield/ ton, lactation period/day, types of feed stuffs consumed (berssem, silage, concentrates, tibn, bran, , dry matter intake and amount of feed consumption per year.

Reproductive data: Different parameters were collected about the dairy reproductive performance such as, calving season, calving interval, days open, dry period, date of calving ,date of insemination ,dry off date , types of insemination (artificial or natural) .

Economic data (Costs of dairy production) and fixed costs: It includes the depreciation of buildings, animals, equipments and parlour . The depreciation rates were calculated for the building by dividing the value of building on 25 years, and for par lour 15 years . The animal depreciation calculated according to fixed line method by subtraction of price of animal as meat value from purchase value then, divided by useful life "years" on basis of 13 years [21 and 38].

Variable costs It includes the prices "LE" of drugs, vaccines, disinfectants, veterinary supervision, feed cost includes; barseem (faddan /dairy animal), barseem hay (ton /dairy animal) tibn (heml /dairy animal), silage (ton /dairy animal), concentrates (ton /dairy animal) dry matter (kg/day) and other feed costs, labor cost, and electricity and water cost [31]

Returns of dairy production: It includes the returns "LE" from (milk sales, calves

added to the herd values or sales, animal sale and manure sale) return from milk sales by multiplying total milk produced(corrected 305 days milk) in the year by its price [31] (according to the prices during the years of the study).

Statistical analyses methods and economic analysis:
The data were analyzed using different statistical methods of data analysis, namely: Multivariate, General linear model (GLM) for analysis of variance (ANOVA), this statistical model was constructed to determine the effect of , calving interval , days open and days dry (dry period) on different breeds of dairy cow and their interactions on the productive and reproductive variables and their costs and returns according to the following equation. One way ANOVA: It was done to determine means of calving interval, days open and days dry among different breeds. Duncan's multiple range test (DMRT): It was done to test the significant differences between the mean values of the analyzed parameters which related to productive, reproductive, costs and returns of dairy production [9, 44].

3. RESULTS AND DISCUSSION

3.1. *Effect of days open range within different breeds on different resources pattern used in dairy farms:*
The results in Table (1) cleared that there is a significant differences ($P < 0.01$) of the effect of days open range and cattle breeds on the total feed costs, drug costs, vaccine costs, disinfectant costs, veterinary supervision costs and total veterinary, management costs. The value of total feed cost differ significantly at ($P<0.01$) among different breeds. the higher value found Holstein Friesian (13230.00 LE) within range of ≥111 day and lower value found in Balady breed (3363.10 LE) within range of 91-110day this result agree with [8 and 19] as they reported increase feeding cost with increasing period between calving and conception to support lactation and high feeding to cow to return to cyclicity . The higher value of drug cost observed in days open range in German Friesian (231.22 LE) within range of 91-110 day and lower value found in Holstein Friesian breed (61.66 LE) within range of ≥111 day. While, the vaccine cost of higher value found German Friesian (229.28 LE) within range of ≥111 day and lower value found in Balady breed (12.93 LE) within range of 91-110 day. In addition, the disinfectant cost value of higher value in case of Holstein Friesian (130.67 LE) within range of 91-110 day and lower value found in Balady breed (13.28 LE) within range of 91-110 day. The value of veterinary supervision cost showed a higher value in German Friesian (87.08 LE) within range of ≥111 day and lower value found in Balady breed (34.48 LE) within range of 91-110 day . While, the veterinary management cost of a higher value found Holstein Friesian 1 (674.05 LE) within range of 91-110 and ≥111 day and lower value found in Balady breed(133.79 LE and 134.00 LE) within range of 91-110 and ≥111 day this result of increasing total veterinary management with increasing days open attributed to longer days open associated with disease condition as metritis , endometritis or cystic ovarian disease or lameness which need treatment of infected case and vaccination and disinfection to neighboring cases agree with [14 and 6] the variation between Holstein and Balady breed due to management as Holstein exotic breed not well adapted to Egyptian condition as occur in Native breed this result agree with [3, 22, 38] they indicate the highest veterinary management cost in Holstein and lowest in Balady breed.

3.2. Effect of days open range within different breeds on returns and costs pattern used in dairy farms:
The results in Table (2) explain the significant differences among different days open range within different breeds

Table 1 Effect of days open within different breeds on cost patterns of dairy cattle

Breed	Days open	N	Total feed cost	Drug cost	Vaccine cost	Disinfectant cost	Veterinary supervision cost	TVM cost
			Mean ± S.E.M	Mean± S.E.M	Mean± S.E.M	Mean± S.E.M	Mean±S.E.M	Mean± S.E.M
Balady	≤80-90	168	3562.32±210.43^{f}	77.08±2.23^{c}	16.71±1.66^{d}	19.44±1.47^{d}	39.58±1.24^{d}	152.82±6.60^{d}
	91-110	29	3363.28±506.48^{f}	73.10±5.37^{c}	12.93±4.01^{d}	13.28±3.53^{d}	34.48±2.97^{d}	133.79±15.88^{e}
	≥111	20	3993.30±609.88^{e}	66.25±6.47^{d}	14.25±4.82^{d}	16.00±4.26^{d}	37.50±3.58^{d}	134.00±19.13^{e}
Total		217	3639.63±177.56^{D}	72.15±2.67^{C}	14.63±1.06^{D}	16.24±0.73^{B}	37.19±1.56^{D}	140.20±6.02^{D}
Cross breed	≤80-90	230	4557.75±112.46^{d}	95.20±1.91^{b}	23.25±1.46^{c}	22.72±1.26^{c}	48.07±1.06^{c}	188.10±5.69^{c}
	91-110	209	4666.00±185.08^{d}	87.18±2.00^{b}	13.95±1.51^{d}	15.81±1.32^{d}	51.37±1.11^{c}	167.91±5.94^{d}
	≥111	227	5414.60±188.77^{c}	97.04±1.92^{b}	23.00±1.44^{c}	15.71±1.26^{d}	63.53±1.06^{b}	198.98±5.68^{c}
Total		666	4879.45±158.42^{C}	93.14±1.88^{B}	20.06±1.00^{C}	18.08±0.63^{B}	54.32±0.94^{C}	184.99±4.45^{C}
German Friesian	≤80-90	118	6075.80±134.48^{b}	225.51±2.66^{a}	222.71±1.99^{a}	123.28±1.75^{b}	84.25±1.47^{a}	655.75±7.87^{a}
	91-110	49	5900.86±207.81^{b}	231.22±4.13^{a}	229.08±3.08^{a}	127.96±2.72^{b}	85.78±2.29^{a}	674.05±12.22^{a}
	≥111	388	5760.35±74.13^{b}	230.62±1.47^{a}	229.28±1.10^{a}	127.07±0.97^{b}	87.08±0.81^{a}	674.05±4.35^{a}
Total		555	5912.33±108.48^{B}	229.12±0.90^{A}	227.02±1.29^{A}	126.10±0.95^{A}	85.70±0.95^{A}	667.95±4.09^{A}
Holstein Friesian	≤80-90	277	12310.00±2016.29^{a}	63.61±1.74^{d}	32.08±1.30^{b}	128.81±1.14^{a}	62.09±0.96^{b}	285.10±5.14^{b}
	91-110	170	12070.00±2573.76^{a}	63.85±2.22^{d}	34.07±1.65^{b}	130.67±1.46^{a}	62.12±1.23^{b}	291.82±6.56^{b}
	≥111	1104	13230.00±1009.97^{a}	61.66±0.87^{d}	31.73±0.65^{b}	128.43±0.57^{a}	61.88±0.48^{b}	283.92±2.57^{b}
Total		1551	12536.67±851.60^{A}	63.04±0.38^{D}	32.62±0.41^{B}	129.30±0.51^{A}	62.03±0.06^{B}	286.95±1.36^{B}

Lower case letters indicated that days open range mean of different letters within the same column significantly different at (p<0.01). While upper case letters indicated that breeds means in the same column of different letters significantly different at (p<0.01)

Table 2 Effect of days open within different breeds on patterns of return

Breed	Days open	N	Milk sales	Calf sales	Litter sales	Total return	Total cost	Profit
			Mean ± S.E.M	Mean±S.E.M	Mean ± S.E.M	Mean ± S.E.M	Mean±S.E.M	Mean±S.E.M
Balady	≤80-90	168	6305.00±195.25^{e}	925.06±19.15^{c}	106.85±2.53^{b}	7336.91±216.93^{e}	4639.37±259.55^{e}	2697.54±42.62^{f}
	91-110	29	6618.00±484.29^{e}	851.03±46.10^{d}	125.86±6.09^{a}	7594.90±536.38^{e}	4228.1±324.72^{f}	3366.8±211.66^{e}
	≥111	20	8208.00±581.44^{d}	932.00±55.52^{c}	105.00±7.33^{b}	9245.00±644.29^{d}	5192.8±752.27^{d}	4052.20±107.98^{d}
Total		217	7043.67±176.09^{D}	902.70±20.65^{D}	112.57±6.08^{B}	8058.93±202.82^{D}	4686.75±219.12^{D}	3372.18±16.30^{D}
Cross breed	≤80-90	230	9874.00±648.44^{c}	976.64±16.74^{c}	73.49±2.16^{c}	10924.12±667.34^{c}	5826.31±156.24^{c}	5097.81±511.10^{c}
	91-110	209	9643.00±680.24^{c}	852.36±17.60^{d}	66.96±2.27^{c}	10562.32±700.11^{c}	5907.31±231.40^{c}	4655.01±468.71^{d}
	≥111	227	9438.00±652.71^{c}	1179.00±16.66^{b}	76.31±2.18^{c}	10693.31±671.55^{c}	6690.97±232.60^{c}	4002.34±438.95^{d}
Total		666	9651.67±71.47^{C}	1002.6±20.41^{C}	72.25±1.68^{C}	10726.58±93.56^{C}	6141.53±202.23^{C}	4585.05±108.67^{C}
German Friesian	≤80-90	118	14420.00±905.30^{b}	2979.00±22.86^{a}	119.57±3.02^{a}	17518.57 ±931.18^{b}	8416.73±196.17^{b}	9104.84±717.01^{b}
	91-110	49	14520.00±1039.07^{b}	2990.00±35.47^{a}	120.84±4.68^{a}	17630.±1079.22^{b}	8244.84±303.47^{b}	9385.16±775.75^{b}
	≥111	388	14030.00±499.25^{b}	2994.00±12.60^{a}	121.25±1.67^{a}	17145.25±513.52^{b}	8049.90±108.13^{b}	9095.35±405.39^{b}
Total		555	14323.33±308.86^{B}	2987.67±2.96^{B}	120.55±0.55^{A}	17431.55±312.37^{B}	8237.29±130.22^{B}	9194.29±182.15^{B}
Holstein Friesian	≤80-90	277	32840.00±590.88^{a}	3000.00±14.92^{a}	122.87±1.97^{a}	35962.8±607.77^{a}	14994.47±2056.54^{a}	20968.4±1448.77^{a}
	91-110	170	32030.00±754.24^{a}	3000.00±19.04^{a}	122.13±2.52^{a}	35152.13±775.80^{a}	14771.75±2625.10^{a}	20380.38±1849.30^{a}
	≥111	1104	31280.00±295.97^{a}	3000.00±7.47^{a}	122.66±0.99^{a}	34402.66±304.43^{a}	15862.38±1030.12^{a}	18540.28±725.69^{a}
Total		1551	32050.00±326.02^{A}	3000.00±0.01^{A}	122.55±0.25^{A}	35172.55±326.28^{A}	15209.54±857.02^{A}	19963.01±530.74^{A}

Lower case letters indicated that days open range mean of different letters within the same column significantly different at (p<0.01). While upper case letters indicated that breeds means in the same column of different letters significantly different at (p<0.01)

(P< 0.01) on milk sales, calf sales, litter sales, total returns, total costs and net profits. The value of milk sales differ significantly at (P<0.01) among different breeds higher value found Holstein Friesian (32840.00 LE) within range of

≤80-90 day and lower value found in Balady breed (6305.00 LE) within range of ≤80-90 day this agree with Duygu *et al*. [20] who indicate that increasing days open result in decreasing milk production and disagree with Ulutaş and Sezer [47] who observed that cows those conceived shortly after calving had lower 305-day and total milk yield and also disagree with [8] reported that total income from milk sales increase with increasing days open. The value of calf sales differ significantly at (P<0.01) among different breeds higher value found Holstein Friesian (3000.00 LE) within all range and lower value found in Balady breed(851.03 LE)within range of 91-110 day and in Cross breed (852.36 LE) within range of 91-110 day this result agree with [3] as reported that, the average return from calf sale was differed significantly (P<0.05) among dairy breeds, the highest calf sale value recorded for Holstein-Friesian, and the lowest value for Balady cattle. The value of litter sales differ significantly at (P<0.01) among different breeds. The higher value found Balady breed (125.86 LE) within range of 91-110 day while lower value found in Cross breed (66.96 LE) and within range of 91-110 day. The value of total return differ significantly at (P<0.01) among different breeds higher value found Holstein Friesian (35962.80 LE) within range of ≤80-90 day and the lower value found in Balady breed(7336.91 LE) within range of ≤80-90 day this due to Holstein high producing with days open (80-90) lead to length of lactation to be(305 day) and dry period to be 60 day which is regarded as standard lactation length while in Balady breed low production per day and short lactation length this results attributed to high milk sales and high calf sales with short days open this agree with [20] who indicate that increasing days open result in decreasing milk production and disagree with [8] reported increase total return with increasing days open and also disagree with disagree with [47] observed that cows those conceived shortly after calving had lower 305-day and total milk yield. The value of total cost differ significantly at (P<0.01) among different breeds higher value found Holstein Friesian 2 (15862.38 LE) within range (≥111 day) and lower value found in Balady breed (4228.10 LE) within range (91-110 day) this due to increasing total cost with increasing days open agree with [8, 19].The value of net profit differ significantly at (P<0.01) among different breeds higher value found Holstein Friesian (20968.40LE) within range of ≤80-90 day and lower value found in Balady breed (2697.54LE) within range of ≤80-90 day this due to Holstein high producing with days open (80-90) lead to length of lactation to be(305 day) and dry period to be 60 day which is regarded as standard lactation length while in Balady breed low production per day and short lactation length this result attributed to the high milk sales and high calf sales with short days open and decreasing total cost with short days open so lead to increase profit and agree with [24] they reported increasing total cost with increasing days open which lead to decreasing profit and agree with [20] who reported decreasing profitability with increasing days open and disagree with [8] they reported increasing net profit with increasing days open.

3.3. *Effect of dry period range within different breeds on different resources pattern used in dairy farms*

The results in Table (3) cleared that there is a significant difference (P < 0.01) of the effect of days open range and cattle breeds on the total feed costs, drug costs, vaccine costs, disinfectant costs, veterinary supervision costs and total veterinary management costs. The value of feed cost differ significantly at (P<0.01) among different dry period range the higher value observed in Holstein Friesian (14570.00 LE) within range of 61-90 day and lower value found in Balady (3218.43 LE) within range of ≤30-60 day this result agree with

[36, 17 and 27] as they indicate increasing dry period lead to feeding two groups of feeding strategy The far-off diet is low in energy density and is designed to maintain body condition of the cow during the first five weeks of the dry period while the pre fresh transition diet is fed during the final three weeks of the dry period and is designed to acclimate the cow and rumen microorganisms to the high-energy lactation diet that will be fed following calving, so increasing dry period led to increase period of both far off and close up diet and this result disagree with [39] who reported that if shortening dry period so lead to increase amount of concentrate so lead to increase feeding cost also difference between two breeds agree with [3] who indicate that the average cost of feed was the highest for Holstein-Friesian cow and the lowest for Balady cow. The value of drug cost differ significantly at (P<0.01) among different dry period range the higher value observed in German Friesian (ranged from 228.87 to 230.63)among different ranges and lower value found within Holstein Friesian breed (61.68 LE) within range of ≤30-60 this due to with increasing days dry increase drug treatment agree with [30 and 29] as Holstein 2 high producing so tend to have short dry period so no need to use drugs as antibiotics at time of drying off agree with [42]. The value of Vaccine cost differ significantly at (P<0.01) among different dry period range the higher value observed in German Friesian (232.66 LE) within range of ≥91 and lower value Balady breed (8.68 LE) within range of 61-90 day. The value of disinfectant cost differ significantly at (P<0.01) among different dry period range the higher value observed in Holstein Friesian and German Friesian within different ranges (ranged from 123.52 to 129.08 LE) within different ranges and lower value found in Cross breed (13.87 LE) within range of 61-90day. The value of veterinary supervision differ significantly at (P<0.01) among different dry period range the higher value observed in German Friesian (89.02 LE) within range of 61-90 day and lower value found in Balady breed (31.58 LE) within range of 61-90 day. The value of total veterinary management cost differ significantly at (P<0.01) among different dry period range the higher value observed in German Friesian (673.75 LE) within range of ≥91day and lower value found in Balady breed (122.37 LE) within range of 61-90 day) this due to dry period is period for vaccination, de worming and use of drug for disease prevention and mastitis and mastitis control during dry period and early post partum period as with increasing dry period lead to over conditioned cow which exposed to side effect as ketosis and displaced abomasums in early post partum period agree with [25 , 26 and 30].

3.4. *Effect of days dry period range within different breeds on returns and costs pattern used in dairy farms*:

The results in Table (4) explain the significant differences among different dry period range within different breeds (P < 0.01) on milk sales, calf sales, litter sales, total returns, total costs and net profits. The value of milk sales differ significantly at (P<0.01) among different dry period range the higher value observed in Holstein Friesian (33760.00 LE) within range of 61-90 day) and lower value found in Balady breed (5371.00 LE) and within range of ≤30-60day. This due to with increasing dry period lead to increase milk production in the next lactation [4] reported maximum milk production could be attained if dry period 91 – 110 days. The value of calf sales differ significantly at (P<0.01) among different dry period range the higher value observed in Holstein Friesian and German Friesian ranged from 2978.00 to 3000LE) within different ranges and lower value found in cross breed (876.9 LE) within range of ≥91 day this result agree with [3] reported that, the average return from calf sale was differed significantly (P<0.05) among dairy breeds, the highest calf sale value

recorded for Holstein-Friesian, and the lower value for Cross cattle. The value of litter sales differ significantly at (P<0.01) among different dry period range the higher value observed in Balady breed (144.74 LE) within range of 61-90 and lower value found in Cross breed (60.09 LE) within range of ≥91 day.

Table 3 Effect of dry period within different breeds on cost patterns of dairy breeds

Breed	Days dry	N	Total feed cost Mean ± S.E.M	Drug cost Mean ± S.E.M	Vaccine cost Mean ± S.E.M	Disinfectant Mean ± S.E.M	Veterinary supervision Mean ± S.E.M	Total veterinary management costs Mean ± S.E.M
Balady	≤30-60	7	3218.43±268.05^{g}	74.29±10.78^{d}	23.57±8.01^{c}	22.86±7.18^{c}	35.71±6.07^{e}	156.43±32.04^{e}
	61-90	19	3472.32±243.99^{f}	63.68±6.54^{e}	8.68±4.86^{e}	18.42±4.36^{d}	31.58±3.68^{e}	122.37±19.44^{f}
	≥91	191	3599.36±158.46^{f}	76.78±2.06^{d}	16.43±1.53^{d}	18.12±1.38^{d}	39.53±1.16^{e}	150.86±6.13^{e}
Total		217	3430.04±107.06^{D}	71.58±2.66^{C}	16.23±1.06^{D}	19.80±0.73^{B}	35.61±1.56^{D}	143.22±6.01^{D}
Cross breed	≤30-60	90	5001.06±290.80^{d}	113.66±3.01^{b}	33.61±2.34^{b}	28.77±2.00^{b}	40.86±1.69^{d}	216.89±9.04^{c}
	61-90	112	5364.61±260.45^{c}	107.22±2.69^{b}	33.24±2.04^{b}	13.87±1.80^{e}	59.86±1.52^{b}	214.19±8.05^{c}
	≥91	463	4745.92±128.11^{e}	86.03±1.33^{c}	14.57±0.99^{d}	17.16±0.88^{d}	55.74±0.75^{c}	173.49±3.95^{d}
Total		665	5037.20±103.30^{C}	102.30±1.89^{B}	27.14±1.00^{C}	19.93±0.62^{B}	52.15±0.95^{C}	201.52±4.46^{C}
German Friesian	≤30-60	69	5510.25±175.05^{b}	229.86±3.43^{a}	221.23±2.55^{a}	123.52±2.29^{a}	82.68±1.93^{a}	657.29±10.20^{a}
	61-90	310	5925.17±82.86^{b}	228.87±1.62^{a}	226.60±1.20^{a}	126.35±1.08^{a}	89.02±0.91^{a}	670.84±4.81^{a}
	≥91	175	5811.95±110.56^{b}	230.63±2.16^{a}	232.66±1.60^{a}	127.34±1.44^{a}	83.12±1.21^{a}	673.75±6..41^{a}
Total		554	5749.12±89.18^{B}	229.79±0.90^{A}	226.83±1.29^{A}	125.74±0.95^{A}	84.94±0.95^{A}	667.29±4.09^{A}
Holstein Friesian	≤30-60	934	12090.00±1097.46^{a}	61.68±0.93^{e}	31.46±0.69^{b}	128.64±0.62^{a}	61.94±0.53^{b}	283.72±2.77^{b}
	61-90	535	14570.00±1450.06^{a}	62.79±1.23^{e}	32.51±0.92^{b}	129.08±0.82^{a}	61.94±0.69^{b}	286.31±3.66^{b}
	≥91	82	11950.00±3703.87^{a}	65.09±3.15^{e}	35.76±2.34^{b}	127.71±2.10^{a}	61.99±1.77^{b}	290.54±9.36^{b}
Total		1551	12870.00±851.62^{A}	63.19±0.38^{D}	33.24±0.41^{B}	128.47±0.51^{A}	61.96±0.06^{B}	286.86±1.36^{B}

Table 4 Effect of dry period within different breeds on different return patterns

Breed	Dry period	Milk sales Mean ± S.E.M	Calf sales Mean ± S.E.M	Litter sales Mean ± S.E.M	Total return Mean ± S.E.M	Total cost Mean ± S.E.M	Profit Mean± S.E.M
Balady	≤30-60	5371.00±754.71^{g}	985.71±89.43^{e}	92.86±11.92^{d}	6449.57±856.06^{f}	4310.58±499.65^{f}	2138.99±356.41^{g}
	61-90	5572.00±511.61^{f}	1021.00±54.29^{d}	144.74±7.24^{a}	6737.74±573.13^{e}	4628.11±384.56^{e}	2109.63±188.57^{g}
	≥91	6659.00±189.99^{e}	902.83±17.12^{f}	106.28±2.28^{c}	7668.11±209.39^{d}	4648.63±202.80^{e}	3019.48±6.59^{f}
Total		5867.33±176.09^{D}	969.85±20.66^{C}	114.63±6.07^{B}	6951.81±202.82^{D}	4613.23±148.62^{D}	2338.58±54.20^{D}
Cross breed	≤30-60	9754.00±1030.28^{c}	1152.00±25.67^{c}	102.50±3.32^{c}	11008.50±1059.27^{c}	5848.38±356.76^{d}	5160.12±702.51^{c}
	61-90	8602.00±923.56^{d}	1417.00±22.36^{b}	98.40±2.98^{d}	10117.40±948.90^{c}	6590.46±320.66^{c}	3526.94±628.24^{e}
	≥91	9884.00±454.24^{c}	876.9±11.24^{f}	60.09±1.47^{e}	10821.00±466.95^{c}	6093.97±158.07^{c}	4727.03±308.88^{d}
Total		9413.33±71.53^{C}	1148.64±20.44^{B}	87.00±1.67^{C}	10648.97±93.64^{C}	6177.61±147.17^{C}	4471.36±53.53^{C}
German Friesian	≤30-60	13420.00±1176.66^{b}	2978.00±28.49^{a}	121.19±3.80^{b}	16519.19±1208.94^{b}	7822.01±252.79^{b}	8697.18±956.15^{b}
	61-90	14350.00±555.13^{b}	2987.00±13.44^{a}	120.07±1.79^{b}	17457.07±570.36^{b}	8232.99±119.51^{b}	9224.08±450.85^{b}
	≥91	14080.00±738.85^{b}	3000.00±17.89^{a}	122.10±2.38^{b}	17202.10±759.12^{b}	8111.85±159.32^{b}	9090.25±599.80^{b}
Total		13950.00±309.41^{B}	2988.33±2.97^{A}	121.12±0.55^{A}	17059.46±312.93^{B}	8055.61±110.96^{B}	9003.85±201.97^{B}
Holstein Friesian	≤30-60	30720.00±319.82^{a}	3000.00±7.74^{a}	122.68±1.03^{b}	33842.68±328.59^{a}	14723.99±1118.57^{a}	19118.69±789.98^{a}
	61-90	33760.00±422.57^{a}	3000.00±10.23^{a}	122.30±1.36^{b}	36882.30±434.16^{a}	17240.43±1477.95^{a}	19641.87±1043.79^{a}
	≥91	28260.00±1079.37^{a}	3000.00±26.13^{a}	124.39±3.48^{b}	31384.39±1108.98^{a}	14646.20±3775.10^{a}	16738.19±2666.12^{a}
Total		30913.33±326.02^{A}	3000.00±0.01^{A}	123.12±0.25^{A}	34036.46±326.280^{A}	15536.87±857.06^{A}	18499.59±531.32^{A}

Lower case letters indicated that dry period range mean of different letters within the same column significantly different at (p<0.01).
While upper case letters indicated that breeds means in the same column of different letters significantly different at (p<0.01)

The value of total return differ significantly at (P<0.01) among different dry period range the higher value observed in Holstein Friesian (36882.30 LE) within range of 61-90 day and lower value found in Balady breed (6449.57 LE) within range of ≤30-60 day this result agree with [4] who reported maximum milk production could be attained if dry period 91 – 110 days and decreasing dry period result in decrease milk production in the second lactation agree with [27] and Balady breed low in production need long period of dry period to allow mammary gland to proliferate regenerate and increase in size and agree with [38] reported that, total returns are highly significantly different (P < 0.01) from one breed to another. High in Holstein than for Native breeds. The value of total cost differ significantly at (P<0.01) among different dry period range the higher value observed in Holstein Friesian (17240.43 LE) within range of 61-90 day and lower value found in Balady breed (4310.58 LE) within range of ≤30-60 this due to with prolonged days dry increasing total variable cost which constitute large portion of total cost agree with [29] also agree with [50] reported that improvements in reproductive efficiency as with optimum dry period is away to cut costs and increase the efficiency of production and, therefore, profit. The value of net profit differ significantly at (P<0.01) among different dry period range the higher value observed in Holstein Friesian (19641.87 LE) within range of 61-90 day and lower value found in Balady breed (2109.63 LE) within range of 61-90 day this result agree with [3] who reported that the different breeds of cattle had significant (P<0.05) effect on average total return, as, higher net return found in Holstein and lower in Balady breed in Balady breed decrease net return due to increasing total cost .

3.5. *Effect of calving interval range within different breeds on different resources pattern used in dairy farms*:

The results in Table (5) cleared that there is a significant differences (P < 0.01) of the effect of calving interval range and cattle breeds on the total feed costs, drug costs, vaccine costs , disinfectant costs, veterinary supervision costs and total veterinary ,management costs. The higher feed cost value observed in Holstein Friesian (15010.00 LE) within breed range of 457-550 day while lower value found in Balady breed (3538.81 LE) within range of ≤ 365-395 day this due to increasing feed cost with increasing calving interval as due to prolonged calving interval increase lactation length so need increase feed to sustain lactation agree with [8 and 49] and high in Holstein Friesian due to higher prices of feed stuffs and ingredients as the farmer search for good quality feed to sustain the high level of milk production produced by Holstein Friesian . On the other hand, the lower feed cost for Balady breeds might be due to shortage of feed and the farmer not spend more money to purchase concentrates to Balady cattle as a result of low milk production of this breed agree with [3]. The higher drug value observed in German Friesian breed ranged from 228.33 to 230.63LE) within all ranges while lower value found in Holstein Friesian ranged from (60.87 to 63.49 LE) within all ranges . While, the higher vaccine value observed in Holstein Friesian breed (232.87 LE) within breed range (≥ 551day) while lower value found in Balady breed (13.18 LE) within range (396-456 day). Also, the value of disinfectant cost showed the higher value observed in German Friesian breed (130.36 LE) within breed range of 457- 550 day respectively while lower value found in Cross breed (15.55 LE) within range of ≥ 551 day. The higher value of veterinary supervision observed in German Friesian breed (89.91 LE) within breed range of 457-550 day while lower value found in Balady breed (37.50 LE) within range of 396-456 day . The higher value of total veterinary management observed in German Friesian breed (677.06 LE) within breed range of 457-550 day while lower value found in Balady breed (134.09 LE) within range of 396-456 day this due to prolonged calving interval may due to reproductive disease which delay period from calving to conception so lead to

prolonged calving interval this result agree with [14] also agree with [3] who reported that, the highest value of veterinary cost in Holstein-Friesian cow and lowest in Balady breed

3.6. *Effect of days calving interval range within different breeds on returns and costs pattern used in dairy farms*:

The results in Table (6) explain the significant differences among different calving interval range within different ($P < 0.01$) on milk sales, calf sales, litter sales, total returns, total costs and net profits. The value of milk sales showed the higher value observed in Holstein Friesian (33250.00 LE) within range of ≥ 551 day while lower value found in Balady breed (6356.00 LE) within range of ≤ 365-395 day. The value of calf sales of a higher value that observed in Holstein Friesian (3000.00 LE) within range all ranges while lower value found in Balady breed (913.49 LE) within range of ≤ 365-395 day. The higher value of litter sales observed in Holstein Friesian (123.10LE) within range of 396-456 day while lower value found in Cross breed (70.42 LE) within range of 396-456 day. The higher total return value observed in Holstein Friesian (36310.00 LE) within range of ≤ 365-395 day while lower value found in Balady breed (7378.72 LE) within range of ≤ 365-395 day this due to prolonged period of lactation and higher milk production so high milk sales with prolonged calving interval this result agree with [8 and 50] who reported that increased milk production and prolonged calving interval Positive significant correlation (0.56775, *P<0.0001*) was found between standardized milk production and calving interval while Holstein Friesian produced large amount of milk per day in comparison with Balady breed so Balady breed need prolonged lactation length to increase return . This due to breed difference in milk production and value of calf sales as Holstein Friesian higher than Balady breed according to difference in breed performance and breed characters The results run in the same line of [3]. And [40] who concluded that reducing the calving interval with 10 days would yield increase in total return. The higher total cost value observed in Holstein Friesian breed (17629.73 LE) within breed range of 457-550 day while lower value found in Balady breed (4586.65 LE) within range of ≤ 365-395 day. The higher net profit value observed in Holstein Friesian (21459.14 LE) within range of ≤ 365-395 day while lower value found in cross breed (1348.32 LE) within range of 457-550 day this result agree with [40] who concluded that reducing the calving interval with 10 days would yield increase in total return and so increase net return and decrease net return with increasing calving interval due to increase total cost as (net return = total return –total cost) as mentioned by [49]. Also, this result disagrees with [8] who reported that the net return increased with prolonged calving interval. Also, our results concluded that, the breed, day's open, dry period and calving interval of great economic effect on profitability of the dairy farms and its economic efficiency. The longer the dry period, than 61 – 90 day; days open than 80 – 90 days and the longer calving interval than 365 – 395 days causes decreasing the total returns and increasing production costs with lowering the net-profits.

4. REFERENCES

1. Ageeb, A. G. and Hayes, J. F. 2000. Reproductive responses of Holstein – Friesian cattle to the climatic conditions of central Sudan. *Tropical Animal Health and Production*. **32**(4): 233-243.
2. Ahmed, I.A.M. .2011. Economic analysis of productive and reproductive efficiency in dairy cattle, Ph.D. of Vet. Medical Science, Menofia University – Sadat branch, Egypt
3. Ajili N; Rekik A., Gara Ben., Bouraoui, R. 2007. Relationships among milk production, reproductive traits, and herd life for Tunisian Holstein-Friesian cows. *African J. Agri. Res*., **2** (2): 047-051.
4. Aly, H. M., Ibrahim, S. A., Rabie, Z. B., Khalifa, Z. A., Hussien, K. 2002. Effects of previous days open, previous days dry and current days open on milk production in Friesian cows. *J. Agric. Sci. Mansoura Univ*., **27**:971.

Table 5 Effect of calving interval within different breeds on cost patterns of dairy cow

Breed	Calving interval	Total feed cost	Drug cost	Vaccine cost	Disinfectant cost	Veterinary supervision cost	Total veterinary management cost
		Mean ± S.E.M	Mean±S.E.M	Mean ± S.E.M	Mean ± S.E.M	Mean ± S.E.M	Mean± S.E.M
Balady	≤365-395	3538.81±194.87^{g}	76.51±2.06^{e}	16.30±1.5^{e}	18.52±1.37^{c}	38.85±1.14^{f}	150.17±6.11^{f}
	396-456	3901.73±329.61^{f}	67.05±6.12^{f}	13.18±4.61^{f}	16.36±4.07^{c}	37.50±3.40^{f}	134.09±18.21^{g}
Total		3720.27±107.69^{D}	71.78±2.66^{C}	14.74±1.06^{D}	17.44±0.73^{B}	38.17±1.56^{D}	142.13±6.01^{D}
Cross breed	≤365-395	4656.87±131.82^{e}	93.93±1.39^{d}	19.02±1.06^{d}	19.09±0.92^{c}	49.94±0.77^{e}	181.98±4.14^{e}
	396-456	5234.44±188.06^{d}	87.29±1.98^{d}	21.18±1.50^{d}	16.56±1.31^{c}	60.40±1.10^{d}	185.44±5.89^{e}
	457-550	5704.61±622.95^{c}	140.36±7.68^{b}	35.36±5.78^{b}	15.79±5.10^{c}	79.93±4.27^{c}	271.43±22.82^{c}
	≥551	5989.91±702.78^{c}	124.55±8.66^{c}	29.09±6.52^{c}	15.55±5.10^{c}	79.46±4.81^{c}	248.64±25.75^{d}
Total		5396.46±102.77^{C}	111.53±1.88^{B}	26.16±1.00^{C}	16.74±0.63^{B}	67.43±0.94^{B}	221.87±4.45^{C}
German Friesian	≤365-395	6024.48±104.65^{b}	229.09±2.07^{a}	225.36±1.56^{a}	125.66±1.37^{b}	84.53±1.15^{b}	664.64±6.15^{a}
	396-456	5987.14±139.81^{b}	230.32±2.76^{a}	225.65±2.08^{a}	124.14±1.84^{b}	89.33±1.54^{a}	669.45±8.22^{a}
	457-550	6070.82±125.02^{b}	228.33±2.66^{a}	228.46±2.00^{a}	130.36±1.77^{a}	89.91±1.48^{a}	677.06±7.90^{a}
	≥551	5267.93±109.29^{c}	230.63±2.46^{a}	232.87±1.85^{a}	125.48±1.64^{b}	83.60±1.37^{a}	672.57±7.32^{a}
Total		5837.59±108.30^{B}	229.59±0.90^{A}	228.09±1.29^{A}	126.41±0.50^{A}	86.84±0.95^{B}	670.93±3.64^{A}
Holstein Friesian	≤365-395	12180.00±1459.89^{a}	63.49±1.25^{g}	32.99±0.94^{c}	129.03±0.83^{a}	62.07±0.70^{d}	287.58±3.72^{b}
	396-456-?	11970.00±1966.49^{a}	62.44±1.68^{g}	32.17±1.27^{c}	129.42±1.12^{a}	61.91±0.94^{d}	285.94±5.01^{b}
	457-550	15010.00±1588.44^{a}	60.87±1.36^{g}	30.78±1.02^{c}	128.62±0.90^{a}	61.89±0.76^{d}	282.16±4.04^{b}
	≥551	12100.00±1983.60^{a}	61.90±1.70^{g}	32.17±1.28^{c}	127.69±1.13^{b}	61.84±0.94^{d}	283.60±5.05^{b}
Total		12815.00±851.62^{A}	62.17±0.38^{D}	32.03±0.41^{B}	128.69±0.51^{A}	61.93±0.06^{C}	284.82±1.36^{B}

Lower case letters indicated that calving interval range means of different letters within the same column significantly different at (p<0.01). While upper case letters indicated that breeds means in the same column of different letters significantly different at (p<0.01)

Table 6 Effect of calving interval within different breeds on total return pattern

Breed	Calving interval	N	milk sales	calf sales	litter sales	Total return	Total cost	Profit
			Mean ± S.E.M	Mean±S.E.M	Mean ± S.E.M	Mean ± S.E.M	Mean ± S.E.M	Mean± S.E.M
Balady	≤365-395	195.00	6356.00±182.62^{f}	913.49±15.35^{c}	109.23±2.35^{c}	7378.72±200.32^{e}	4586.65±238.75^{h}	2792.07±38.45f
	396-456	22.00	7993.00±548.80d	936.36±45.71^{c}	109.09±6.99^{c}	9038.46±601.50d	5069.23±710.85^{g}	3969.23±109.34^{f}
Total		217.00	7174.50±176.09^{D}	924.93±20.66^{C}	109.16±6.07^{B}	8208.59±202.82^{D}	4827.94±149.24^{D}	3380.65±53.58^{B}
crossbreed	≤365-395	410.00	9798.00±80.50^{c}	938.27±10.59^{c}	71.70±1.58^{d}	10807.97±92.68^{c}	5916.79±166.41^{f}	4891.18±73.73^{d}
	396-456	206.00	9694.00±134.98^{c}	965.63±14.94^{c}	70.42±2.26^{d}	10730.05±152.14^{c}	6412.55±235.94^{e}	4317.50±83.80^{d}
	457-550	14.00	6497.00±413.56e	2500.00±57.30^{b}	101.79±8.76^{c}	9098.79±449.19^{d}	7750.47±793.49^{d}	1348.32±344.30^{i}
	≥551	11.00	7229.00±2956.24^{d}	2500.00±64.64^{b}	100.36±9.89^{c}	9829.36±488.09^{d}	8013.36±894.74^{c}	1816.00±406.65^{h}
Total		641.00	8304.50±71.47^{C}	1725.97±20.41^{B}	86.07±1.68^{C}	10116.54±93.55^{C}	7023.29±201.97^{C}	3075.20±55.41^{C}
German Friesian	≤365-395	193.00	14460.00±705.76^{b}	2984.00±15.43^{a}	120.55±2.36^{b}	17564.55±723.55^{b}	8363.14±151.14^{c}	9201.41±572.41^{c}
	396-456	108.00	14430.00±943.46^{b}	2981.00±20.63^{a}	120.09±3.16^{b}	17531.09±967.25^{b}	8308.91±198.97^{c}	9222.18±768.28^{c}
	457-550	117.00	14880.00±906.45^{b}	2996.00±19.82^{a}	119.66±3.03^{b}	17995.66±929.30^{b}	8388.19±184.70^{c}	9607.47±744.60^{c}
	≥551	136.00	12880.00±840.75^{b}	3000.00±18.38^{a}	122.84±2.81^{a}	16002.84±861.95^{b}	7490.43±164.62^{d}	8512.41±697.33^{d}
Total		554.00	14162.50±309.41^{B}	2990.25±2.97^{A}	120.79±0.55^{A}	17273.54±312.93^{B}	8137.67±155.62^{B}	9135.87±157.31^{B}
Holstein 2	≤365-395	528.00	33187.50±426.70^{a}	3000.00±9.33^{a}	122.50±1.43^{a}	36310.00±437.45^{a}	14850.86±1487.99^{b}	21459.14±1050.54^{a}
	396-456	291.00	30716.90±574.76^{a}	3000.00±12.57^{a}	123.10±1.92^{a}	33840.00±589.25^{a}	14638.84±2004.32^{b}	19201.16±1415.07^{a}
	457-550	446.00	29677.40±464.27^{a}	3000.00±10.15^{a}	122.60±1.55^{a}	32800.00±475.97^{a}	17629.73±1619.00^{a}	15170.30±1143.03^{b}
	≥551	286.00	32817.50±579.77^{a}	3000.00±12.68^{a}	122.49±1.94^{a}	35940.17±594.38^{a}	14736.83±2021.76^{b}	21176.00±1427.38^{a}
Total		1551.00	31599.83±326.02^{A}	3000.00±0.01^{A}	122.67±0.25^{A}	34722.54±326.28^{A}	15464.07±857.15^{A}	19251.65±530.87^{A}

Lower case letters indicated that calving interval range means of different letters within the same column significantly different at (p<0.01). While upper case letters indicated that breeds means in the same column of different letters significantly different at (p<0.01

5. Angela, R. B. 2004. Factors influencing the reproductive efficiency of dairy herds in the Dominican Republic Virginia. Polytechnic Institute and State University Master of Science in Veterinary Medical Science.
6. Annen, E. L., Collier, R. J., Mc Guire, M. A., Vicini, J. L., Ballam, J. M., Lormore, M. J. 2004. Effect of modified dry period lengths and bovine somatotropin on yield and composition of milk from dairy cows. *J. Dairy Sci*. **87**: 3746–3761.
7. Arbel,R.;Bigun .Y., Ezra, E., Sturman ,H., Hojman ,D. 2001. Effect of extended calving interval in Highlactating cows on milk production and profitability .*J .dairy sci*. **84**: 600-608.
8. Armitage, P., Berry, G., Matthews, J. N. S. 2002. Statistical methods in medical research (4th edition). Oxford: Blackwell Science.
9. Bachman, K. C. 2002. Milk production of dairy cows treated with estrogen at the onset of a short dry period. *J. Dairy Sci*. **85**:797-803.
10. Bachman, K. C., Schairer, M. L. 2003. Invited review: Bovine studies on optimal lengths of dry periods. *J. Dairy Sci.* **86**: 3027–3037.
11. Bahonar, A.R., Azizzadeh M., Stevenson, M.A., Vojgani, M., Mahmoudi, M. 2009. Factors Affecting Days Open in Holstein Dairy Cattle in Khorasan Razavi Province, Iran; A Cox Proportional Hazard Model) *Journal of Animal and Veterinary Advances*. **8**: 747-754.
12. Barozai,Y.H.,Rafeed,M..,Baloch,H.S.,hah zad,I., Hilal,B., Mudassar, J. 2011. Study on performance analysis of Holstein Friesian cattle under intensive management at government dairy farm, Pishin, *Balochistan ABAH* **3**: 65-70
13. Bouraoui, R., Rekik, B., Ben Gara, A. 2009. Production and reproduction performances of "Brunes des Alpes" and "Montbéliarde" cows in sub- humid areas in the north of Tunisia. Rencontre Recherche Ruminants **21**: 371.
14. Bujko, J., Žitný, J., Strapák, P., Pjontek, J., Hrnčák, C. 2010. Factors effecting on calving interval in breeding herds of Slovak spotted breed, Acta fytotechnica et zootechnica **13** (special edition): 58-61
15. Cilek, S. 2010. Reproductive traits of Holstein cows rose at Polatli state farm in Turkey. *J Anim. Vet. Adv*. **8**: 1-5.
16. Contreras, L.L., Ryan, C.M., Overton ,T.R. 2004. Effects of dry cow grouping strategy and prepartum body condition score on performance and health of transition dairy cows. *J. Dairy Sci.* **87**: 517-523.
17. Cools, S., ossaert, P., Caluwaerts, T., Kostens, M., Opsomer, G., Kruif, A. D. 2009. The economic consequences of extending the calving interval in high producing dairy cows. Vlaams Diergeneeskundig Tijdschrift. **77**: 406-413.
18. De vries, A., leeuwen, J.V., Thatcher, W.W. 2005. Economics of improved reproductive performance in dairy cattle. AN156, one of a series of the Department of Animal Sciences, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, ;university of Florida. Published August 2005. Reviewed February 2010.
19. De vries, A. 2006. Economic value of pregnancy in dairy cattle .*J dairy science* **89**: 3876-3885.
20. Duygu, A., Fusun, T., Ferhan, S. 2009. Determination of milk production costs on the member farms of sheep and goat breeders' association in Canakkale. *J. Anim. Vet. Adv*. **8**: 526-529.
21. El-Tahaway, A. S. 2007. Cattle diseases and their effects on economic and productive efficiency of dairy farms. Ph.D. Faculty of Veterinary Medicine, Alexandria University.
22. Fikre L 2007. Reproductive and lactation performnace of daíry cattle in the Oromia Central Highlands of Ethiopia. Doctoral diss. Dept. of Clinical Sciences, SLU. *Acta Universitatis agriculturae Sueciae* **2007**: 121.
23. French, P. D., R. L. Nebel. 2003.The simulated economic cost of extended calving intervals in dairy herds and comparison of reproductive management programs. *J. Dairy Sci.* **86**: 54 (abstract)
24. Geishauser, T.K., Leslie , K., Tenhag, J., Bashiri, A. 2000. Evaluation of eight cow - side ketone tests in milk for detection of subclinical ketosis in dairy cows. *J. Dairy Sci*. **83**:296-299.
25. Gillund, P.; Reksen, O., Gröhn, Y.T., Karlberg, K. 2001. Body condition related to ketosis and reproductive performance in

norwegian dairy cows *J. Dairy Sci*. **84**: 1390-1396.
26. Grummer ,R.R., Rastani, R.R. 2005. Strategies for Shortening the Dry Period) Proceedings of the 7 Western Dairy Management Conference, March 9-11, 2005 (129-140)
27. Gulay, M. S., Hayen, M. J., Bachman, K. C.; Belloso, T., Liboni, M., Head, H. H. 2003. Milk production and feed intake of Holstein cows given short (30-days) or normal (60-days) dry periods. *J. Dairy Sci*. **86**: 2030–2038.
28. . Halasa, T.H.B., Nielen, M., Werven, T. V., Hogeveen, H. 2010. A simulation model to calculate costs and benefits of dry period interventions in dairy cattle. *Livestock Science*. **129**: 80-87.
29. Huijps,K., Hogeveen,H. 2007. Stochastic Modeling to Determine the Economic Effects of Blanket, Selective, and No Dry Cow Therapy). *J. Dairy Sci*. **90**: 1225-1234
30. Kavoi, M.M.; Hoag, D.L. and Pritchett, J. 2010. Measurement of economic efficiency for smallholder dairy cattle in the marginal zones of Kenya). *JDAE* **2**: 122-137.
31. Lateef, M. 2007. Production performance of Holstein Friesian and Jersey cattle in sub tropical environment of the Punjab, Pakistan, Ph. D. thesis, University of agriculture, Faisalabada, Pakistan.
32. Lyimo C., Nukya R., Schoolman, L., Van Eerdenbutg, F. J. 2004. Post-partum reproductive performance of crossbred dairy cattle on smallholder farms in sub humid coastal Tanzania. *Trop Anim Health and Prod*. **36**: 269-279.
33. Maizon, D., Oltenacu, P., Grohn ,Y. 2004. Effects of diseases on reproductive performance in Swedish Red and White dairy cattle. *Preven. Vet. Med*. **66**: 113-126.
34. Masama, E., Kusina, K.T., Sibanda, S., Majoni, C. 2003. Reproduction and lactation performance of cattle in a smallholder dairy system in Zimbabwe. *Trop Anim Health and Prod*. **35**: 117-129.
35. Mashek, D.G., Beede, D.K. 2001. Peripartum responses of dairy cows fed energy-dense diets for 3 or 6 weeks prepartum. *J. Dairy Sci*. **84**: 115-125.
36. Mureda, E., Zeleke, M.Z. 2008. Reproductive Performance of Crossbred Dairy Cows in Eastern lowlands of Ethiopia. *Livest. Res. Rur. Deve*. **19**: 161.
37. Omar, M.A.E. 2009. Economic study on the productive and reproductive efficiency in dairy farms in relation to veterinary management. Ph.D., Fac. Vet. Med., Zagazig University, Egypt.
38. Overton , T.R. 2005. Is There a Place for Short Dry Periods for High Producing Herds?) *Advances in Dairy Technology*. **17**: 25-34.
39. Ozsvari, L., Toth, F., Gabor, G., Szenci, O. 2007. The economic importance of reproductive management in dairy herds.) *Revista Romana de Medicina Veterinara*. **17**: 37-46.
40. Rastani, R. R., Grummer R. R. 2006. Chapter 13. Consequences of shortening the dry period in dairy cows in Recent Advances in Animal Nutrition-2005. Edited by P. C. Garnsworthy and J. Wiseman. Nottingham Univ. Press. Nottingham, England.
41. Sara Österman 2003. Extended Calving Interval and Increased Milking Frequency in Dairy Cows Effects on Productivity and Welfare) Doctoral thesis Swedish University of Agricultural Sciences Uppsala 2003
42. Smith, J. W., Gilson, W. D., Ely, L. O. 2002. Dairy Reproductive Bench marks. Animal and dairy science Department, Bulletin 1210/ March, 2002.
43. SPSS 2004. Statistical Package for Social Sciences. Release 16.0.1 version. SPSS Inc.
44. Sutradhar,A. B. C., Hasanuzzaman, M., Azad, M.A.K., Kumar, S. 2008. Management Productive and Reproductive Performances of Dairy Farm, *Pakistan J. Nut*. **7**: 408-411.
45. Swai E S., Kyakaisho P., Ole-Kawanara, M. S. 2008. Studies on the reproductive performance of crossbred dairy cows raised on smallholder farms in eastern Usambara Mountains, Tanzania. *Livest. Res. Rur. Deve*. **19**: 61.
46. Tekeril, M. 2000. Main factors affecting milk yield of Holstein cattle breed under different conditions and essential parameters of selection. I. Effects of environment and heredity on the shape of the lactation curve. *Lalahan-Hayvancilik-Arastirma Enstitusu-Dergisi*. **40**: 1-13.

47. Ulutaş, Z., Sezer, M. 2009. Genetic study of milk production and reproduction traits of local born Simmental cattle in Turkey, *Ziraat Fakültesi Dergisi***. 26**: 53-59.
48. Voore, M., Saveli, O. 2004. Effect of calving interval in high-yielding cows on milk yield and composition and production costs). Animal breeding in the Baltics. 10th Baltic Animal Breeding Conference, Tartu, Estonia, 13-14 May 2004. 2004. 105-110.
49. Watters, R. D., Wiltbank, M. C., Guenther, J. N., Brickner, A. E., Rastani, R. R., Fricke, P. M., Grummer, R. R. 2009. Effect of dry period length on reproduction during the subsequent lactation. *J. Dairy Sci*. **92**: 3081–3090.
50. Zuzana Riecka., Candrák, J. 2011. Analysis of Relationship between Production and Reproduction Traits of Holstein Cattle Population in the Slovak Republic *Animal Science and Biotechnologies* **44**: 332-336.

مجلة بنها للعلوم الطبية البيطرية
BENHA UNIVERSITY
FACULTY OF VETERINARY MEDICINE

تأثير الفترة بين ولادتين والفترة بين الولادة والاخصاب و فترة الجفاف على الكفاءة الاقتصادية لمزارع انتاج الالبان

جمال عبد الرحيم سوسه[1]، سند طلعت عطا الله [2]، ليزا صبري رضا[1]

[1] كلية الطب البيطري جامعة بنها،[2] كلية الطب البيطري جامعة الأسكندرية

الملخص العربي

تهدف الدراسة الى معرفة تأثير الفترة بين ولادتين والفترة بين الولادة و حدوث اخصاب و فترة الجفاف على الكفاءة الانتاجية و الاقتصادية لمزارع انتاج الالبان في مصر. لقد تمت الدراسة خلال الفترة (2009 حتى 2011) شملت الدراسة ثلاث قطاعات للأنتاج الحيواني (الفلاحي و القطاع الخاص والقطاع الحكومي) و اشتملت الدراسة على ثلاث سلالات هي الابقار البلدية و الابقار الخليط (بلدي مع هولشتين فرزيان) و أبقار الهولشتين فريزيان و قد تم جمع البيانات من خلال السجلات المتاحة في بعض المزارع و من خلال الاستبيان لبعض المربين و قد أظهرت الدراسة النتائج مثل(وجود فروق معنوية لتأثير السلالة و الفترة بين الولادتين والفترة بين الولادة و حدوث الاخصاب و فترة الجفاف على المتغيرات التي تؤثر في الكفاءة الانتاجية والاقتصادية للابقار , سلالة الهولشتين فريزيان أفضل السلالات من حيث الايرادات وصافي الربح وان أفضل فترة بين ولادتين هي (≥ 365–395 يوم),وأن أفضل فترة ين الولادة وحدوث أخصاب (≥80– 90 يوم) و أن أفضل فترة جفاف هي (61–90 يوم) و بزيادة الفترات عن هذه المدة فانها تؤدي الى نقص الايرادات و زيادة التكاليف المستخدمه في الأنتاج مما يؤدي الى تناقص صافي العائد) .خلصت الدراسة الى ان فترة الجفاف والفترة بين الولادة وحدوث اخصاب والفترة بين ولادتين من اهم العوامل التي تؤثر على انتاجية وارباحية مزارع الالبان.

(مجلة بنها للعلوم الطبية البيطرية: عدد 23 (1)، يونيو 2012: 94–108)