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The Effect of Socio-Personal Factors on Economic and Managerial Variables in Shahroud Commercial Dairy Farms

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Abstract

The purpose of this research was to study the effects of four personal and social variables including the age, literacy, job experience and size of herd on different variables such as implementing of managerial strategies in transition period, relevant costs of these strategies, average production per head and gross income of milk sale per head. For this purpose all required information were collected through questionnaire distribution among the owners of commercial dairy farms of Shahroud district. This questionnaire was included three parts. Relevant information about personal and social indices was inserted in first part. Second part included of relevant information about performance and non-performance of considered managerial strategies in transition period and third part was about relevant information about production and economic records. Finally all information about 50 herds was obtained and compared as well. Data analysis was through applying Multiple Linear Regression (MLR) method. Also it was possible to specify any relation among independent and dependent variables through calculation of Pearson Correlation Coefficient. Finally it was revealed that social and personal factors have a significant effect on the implementation of management strategies and other independent factors.

Keywords:
Personal and Social indices, Managerial strategies, transition period, Managerial and Economic indices

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INTRODUCTION

Transition period, from 3 weeks before upto 3 weeks after parturition of dairy cows, is critically important to health, production, and profitability of dairy herds. Most health disorders occur during this time. There are lots of serious changes for dairy cows in transition period from the end of pregnancy up to the beginning of lactation period. This period was really important for many years and for a lot of researchers due to the effects on the health, production and profitability by focusing on nutrition and management of dairy cows. (Drackley, 1999) In this research current conditions of animal husbandry centers and any effects of the mentioned variables have been studied on different managerial and economic indices. There are different studies that have pointed out to the effect of some personal and social factors which are effective on the economic and managerial indices at commercial dairy farms. It is in a way that mentioned factors have an effective role in applying of modern technologies. For instance, Carley and Fletcher, (1986) stated that older cattlemen have more resistance against new technologies. Regarding the academic records again it was mentioned that bearing a high school or university degree by managers of animal husbandry centers have a positive effect in selection of managerial methods. In a research made by Alqunaibet *et al.,* (1995) on dairy herds at Saudi Arabia, it was revealed that any increase in the size of herd makes better economic situation for benefiting from technology.

Also in another research by Hanson *et al.,* (1998) on dairy herds at North America under intensive grazing and open grazing, it was revealed that cattlemen with higher profitability had little job experiences but higher academic records. In another research made by Vandermersh and Mathijs (2002) at husbandry animal centers of Belgium, it was revealed that the age of managers and other managerial factors had no more effects on risks and intends of them in progress of different groups. Regarding the effect of job experience Blelik and Rajcaniova (2004) stated that higher work experiences do not have a significant effect on technical efficiency on the farm. Latruffe *et al.,* (2004) considered academic records and education as two important factors in upgrading technical efficiency level of animal husbandry units. In another study in Slovakia's farms by Blelik and Rajcaniova (2004), it was specified that literacy and education level have a positive but not significant effect on efficiency of the farmers. They concluded in the same research that generally any increase in size of the production units may firstly decrease margin costs and increases the profit return. But any oversize of the agency may cause a reduction in return profit and increase of margin costs. Latruffe *et al.,* (2004) stated that in case of any increase in size of herd, there will be an increase in technical efficiency.

Demircan *et al.,* (2006) has also concluded that the size of herd and number of herd's dairy cows have a positive effect on managerial methods of the herd. In case of any increase in the size of the herd, there will be an increase in gross profit but it is not significant. Furthermore, regarding the effect of owner's age on profitability, Gloy *et al.,* (2006) stated that older managers at animal husbandry centers have little efficiency. Ramezani (2009), Ortega *et al.,* (2007), Dagistan *et al.,* (2009) have also stated that higher job experience may increase the efficiency and productivity of managers. Ceyhan and Hazenci (2010) found out that experiences and education levels has no relations with economic efficiency. The objectives of this research are to evaluate the effects of above social and personal factors on important managerial and economical factors in commercial dairy farms in transition priod.

MATERIALS AD METHODS

The present study has been done from January 2011 up to April 2011 in commercial dairy herds of Shahroud district. Data was collected through direct interview with dairy farmers. More than 65 dairy farms located at Shahroud district all of them were selected for interview, about 15 questioners were considered as invalid due to different mistakes and thus data obtained from 50 questionnairs

were processed. The questionnaire included different questions about personal and social factors, age of farmers, education level, work experiences and size of the dairy herd. Upon collection of these information it was possible to change it into quantitative information through grading system for further analysis (Table 1). The next part of this questionnaire included relevant information about managerial strategies of transition period and effective managerial policies for prevention of important metabolic disorders in that period. The mentioned managerial strategies include 14 items separated in accordance with the effect of different disorders.

According to the type of disorders, these strategies include five managerial strategies effective on Ketosis, three managerial strategies effective on Acidosis prevention, 3 managerial strategies effective on milk fever and two managerial guidelines effective on displaced abomasums and finally one managerial strategy effective on retained placenta incidence rate (Table 2).

In addition all information about production rate and gross income per head was gathered through the production records of farmers.

Data analysis was made by using SAS software with application of Multiple Linear Regression model (MLR). the outlines of model are explained below:

$$Y1=\beta 01+ \beta 11X1+\ldots+ \beta q1Xq+\varepsilon 1$$
$$Y2=\beta 02+ \beta 12X1+\ldots+ \beta q2Xq+\varepsilon 2$$
.
.
.
$$Yp= \beta 0p+ \beta 1pX1+\ldots+ \beta qpXq+ \varepsilon p$$

$$\rho_{x,y} = \frac{\mathrm{cov}(x, y)}{\sqrt{(\mathrm{var}\ x)(\mathrm{var}\ y)}} = \frac{\sigma_{xy}}{\sigma_x \sigma_y}$$

Also the correlation coefficient among independent and dependent variables have been calculated by using Pearson correlation coefficient as below:

RESULTS AND DISCUSSION

Age

Age is a factor with double effects as studied in present research. This means that higher age may cause a reduction in productivity due to a reduction in body abilities. On the other hand higher age may cause higher experiences therefore there is an increase in productivity as well. The results of variance analysis (Table 3) showed that age has a significant effect on application rate of managerial strategies in transition period and application costs of

Table 1: Managerial strategies in transition period

Type of disorders	Managerial strategies in transition period
Ketosis	1-Body Condition Score management
	2-Encouraging the animal to use more dry mater (Consuming feeding management):
	3-Benefiting from Propylene Glycol supplement
	4-Benefiting from Niacin supplement
	5-Benefiting from the high quality feeding in transition periods (the importance of feeding quality):
Acidosis	6-Pay attention to the importance of ration's fiber and its rate with concentration:
	7-Increasing the number of feeding
	8-Using Sodium bicarbonate
Milk fever	9-Using anion salts for reducing of ration's DCAD
	10-Limiting the calcium rate in close-up rations
	11-Injection of vitamin D metabolites (AD3E)
Abomasums Displaced	12-Using forage with suitable length and lack of sudden usage of high concentration (Pay attention to the fiber and physical form of the rations)
	13-Increasing the consuming feed after calving
Retained Placenta	14-Injection of E-Selenium two weeks prior to calving

Table 2: Method of grading the personal and social indexes

Grade / Criteria	1	2	3	4	5	6	7
Academic level of the manager	Illiterate	Primary school	3rd Grade of middle school	High School diploma	Associate Degree	Bachelor of Science and higher	
Age (Year)	60 and higher	50-60	40-50	30-40	20-30		
Experience level (Year)	0-5	6-10	11-15	16-20	21-25	26-30	30 and higher
Size of herd (Head)	20-50	51-150	151-300	300 and higher			

implementing strategy ($p<0.01$). This means that by age increase, the rate of application of managerial strategies in transition period and cost of implementation of these strategies increased significantly. These results were in compliance with the findings out of a research made by Emami and Meybodi (2005). But it may reject the findings out of the researches made by Carley and Fletcher (1986) who may believe that older cattlemen have more resistance against new technologies. The result showed that age has a positive and direct effect on average milk production and net income resulted from it ($P<0.01$), which can be attributed to increase in work experience as well as increase in applying of managerial strategy. The obtained results were reject the findings of Gloy *et al.,* (2002) and Demircan *et al*., (2006) and also Tauer and Mishra (2006) who have stated that age increase has a negative effect on milk production and gross income.

Furthermore, the results of variance analysis among age groups pointed out that there is no significant statistical difference in milk production , gross income and application costs of managerial strategies in transition period ($p>0.05$) between different age groups (Table 3).

By calculating the correlation coefficients (Table 4) between the variables of age and other indices, it was specified that there is a positive relation between the age and average rate of applying any managerial strategies in transition period ($r = 0.53$). It is in a way that any increase of age may cause an increase in applying of these strategies. There was also positive relation between age and average production ($r = 0.62$) along with gross income of milk sale per head ($r=0.67$). These findings may approved the results of researches published by Emami and Meybodi (2005), Carley and Fletcher (1986) and Kimberley and Johanson (1989).

Work experience

Analysis of variance, regression interpretation and average comparison showed that work experience had a significant effect on application of managerial strategies, average costs of applying the strategies, average rate of milk production and gross income of milk sale per head ($P>0.05$). The results were not in agreement with the findings of Blelik and Rajcaniova (2004) who stated that higher work experience

Table 3: The obtained results out of Regression and comparisons of the average for personal and social variants

Economic and Manageri variants	Effective Personal and Social variables on economic and managerial indexes							
	Age		Academic records		Work experience		Size of herd	
	F-Test	T-Test	F-Test	T-Test	F-Test	T-Test	F-Test	T-Test
Implementation rate of managerial strategies	44.07**	6.64*	111.08**	10.54*	0.38^{ns}	-0.61^{ns}	7.88**	2.81^{ns}
Implementing costs of managerial strategies	19.60**	4.43^{ns}	41.02**	6.40*	0.01^{ns}	0.11^{ns}	13.20**	3.63^{ns}
Production average	30.95**	5.56^{ns}	85.28**	9.23*	0.00^{ns}	0.05^{ns}	14.94**	3.87^{ns}
Gross income	29.61**	5.44^{ns}	83.38**	9.13*	0.00^{ns}	0.02^{ns}	14.88**	3.86^{ns}

** $p<0.01$ * $p<0.05$ ^{ns} $p>0.05$

Table 4: Correlation coefficients calculated between personal / social and managerial-economic variables

	Age	Experience	Academic records	Size of herd	Average implementation	Implementation costs	Average Production	Gross income
Age	1.00							
Experience	-0.47	1.00						
Academic records	0.58	-0.23	1.00					
Size of herd	0.16	0.24	0.38	1.00				
average implementation	0.69	-0.08	0.83	0.37	1.00			
implementation costs	0.53	0.01	0.67	0.46	0.82	1.00		
average Production	0.62	0.006	0.79	0.48	0.86	0.90	1.00	
Gross income	0.61	0.002	0.79	0.48	0.85	0.89	0.99	1.00

** $p<0.01$ * $p<0.05$ ns $p>0.05$

has not a significant effect on technical efficiency of farms. But the mentioned results were in tune with the findings of Ramezani (2009), Ortega *et al.,* (2007) who stated that higher work experience may increase the efficiency and productivity as well. Also the findings of Ceyhan and Hazenci (2010) who have stated that experience and educational level have no relation with economic efficiency are not in compliance with the results of the present research. The results of average comparison (Table 3.) between different job experience groups showed that there is not a significant difference from view point of applying the managerial strategies, application costs, average production and gross income out of milk sale per head ($P>0.05$).

Upon calculation of the correlation coefficients (Table 4), it was obvious that there was a negative relation between work experience and age ($r = -0.47$) and also negative relation between academic records and work experience ($r = -0.23$). Correlation coefficients of work experience and Implementation costs, average production and gross income from milk sale were respectively 0.0022, 0.006 and 0.01 which are very small from statistical view point.

Academic records

Regarding the academic records of farmers and after variance analysis and further average comparisons, it was revealed that academic records of managers has a significant effect on managerial and economical parameters of production units, application of managerial strategies, performance costs, average milk production and gross income out of milk sale per head ($P<0.01$). These obtained results were in compliance with the findings of researches made by Carley and Fletcher (1986) and Johanson *et al.,* (1989) but it may reject the findings of Vandermersh and Mathjis (2002), Blelik and Rajcaniova (2004). The results of an average comparisons between different groups of the academic records (Table 3) showed that there is a significant difference between application of managerial strategies, implementation costs, average milk production and gross income from statistical viewpoint ($P<0.05$).

Any consideration of correlation coefficients (Table 4) among above mentioned variables and other items showed that there is a relation between academic records and application of managerial strategies of transition period $r=0.83$ which is a sign of further effects of academic records in acceptance and applying of modern managerial methods in Dairy industry.

In addition, there was a positive correlation coefficient between academic records and implementation costs of the managerial strategies in transition period ($r = 0.67$).

The results of correlation analysis indicated that correlation coefficients between literacy level and production average was ($r = 0.79$) which is an indicator of the fact that academic level has a positive effect on implementation of managerial strategies and relevant implementation costs of the startegies which may increase milk production per head. Correlation coefficient for academic level and gross income of milk sale was $r = 0.79$ which showed that level

of education has a positive effect on average milk production which may significantly increase the gross income from milk sale per head.

Size of herd

The results of variance analysis and correlation coefficients showed that herd size has a significant effect on productinal and economical parameters in this research ($P<0.05$). These findings were in compliance with the obtained results by Alqunaibet *et al.,* (1995) who explained that any increase in herd size may cause better economic outcome of technology. Also the mentioned findings may confirm the results that made by Blelik and Rajcaniova (2004) and Latruffe *et al.,* (2004) who stated that any increase in the size of agency may cause an increase in marginal costs, profit and technical efficiency. Average comparisons among different size of the herd showed that there is no significant difference between the studied groups for considered variables accordingly ($P>0.05$).

Calculation of the correlation coefficients (Table 4) showed that there was a positive relation between the size of the herds and average implementation of managerial strategies ($r = 0.37$).

The correlation coefficient of the herd size and application costs of managerial strategies in transition period was $r = 0.46$, correlation coefficient between herd size and average milk production was $r = 0.48$ and it was $r = 0.48$ between herd size and gross income out of milk sale per head.

The results of correlation coefficient analysis showed that the academic records have the highest effects on dependent variables as far as personal and social factors is concerned.

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