International Journal of Agricultural Management and Development (IJAMAD)
Available online on: www.ijamad.iaurasht.ac.ir
ISSN: 2159-5852 (Print)
ISSN:2159-5860 (Online)

Role of Insurance In Broiler Farms Risk Management (A Case Study Of Rudbar County)

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Received: 09 November 2016,
Accepted: 05 September 2017

Abstract

Agriculture sector faces risks caused by natural damaging events. So, it is necessary to predict, counteract and mitigate the risks of agricultural activities to increase investment security, to identify risks and to practice risk management methods, in which insurance has a special niche as a risk counteraction and a mitigation measure. The objective of this study was to study the role of insurance in risk management of broiler farms in the Rudbar County in Guilan Province in 2016. The statistical population was composed of 121 broiler chicken farms that were active in Rubdar County. This study, done in 2013-2015, out of which 55 farms were selected as the sample according to Bartlett Table. Data were collected by interview and a questionnaire whose validity was confirmed by a panel of experts and whose reliability was estimated to be 73% by Cronbach's alpha. Results of stepwise regression showed that the main production parts affected by risk factors included hygiene and control(0.279), technical factors, including ventilation and temperature (-0.313), nutrition (-0.366), disease prevention (-0.273), chicken hatching capacity (0.398) and insurance (-0.339). Results of the test of variable correlations showed a negative, significant relationship of dependent variable (risk management) with hatching capacity, hygiene factors, technical factors, nutrition, disease prevention, and insurance. Also, risk management was found to have no relationship with farm managers' age and farming experience.

Keywords:
risk management, insurance, broiler farms, Rudbar City

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Introduction

Poultry Livestock industry is a dynamic, generating, and employment boosting industry which has the second rank after oil industry in investment absorption. Above all, it is tied up with the food safety and health of the society playing a considerable role in human nourishment as it is the main protein and diary production sector (Amini et al., 2002). Production in poultry sector differs with other business and manufacturing domains.Risk is a time-dependent process and since it is related to an event in future, we get to learn more about it over time so that as time passes in an activity, we learn more about the situation and the nature of the activity and then, most issues which, now, seem to be risk are turned out not to be risk in future (Abourizk, 2002).

Recently, a number of guidelines and standards have included definitions for positive risk or opportunities, i.e. risks that can influence objectives positively. For example, Abourizk (2002) defines risk as the probability of the occurrence of damages and their impacts on one party and, on the contrary, defines opportunity as the probability of encountering a good event and the effect of that event on one party. He states that opportunity is in fact a positive risk and can be managed in a similar way.

Risk management involves the simplification of decision. It refers to a change in decision structure so that danger and risk cannot affect it – here, danger refers to environmental uncertainty (Lingered & Kostor, 2003).

Archin et al. (2015) in a study entitled "a study on the role of insurance in enhancing managerial indices of broiler farming in Boushehr Province" found that the managerial indices were higher in insured group than in uninsured group.

In a study on factors affecting risk and livestock farmers' willingness to insure their livestock in Eastern Azerbaijan Province, Amini et al. (2002) found that diseases posed 78% of dangers to livestock farmers. The statistical tests revealed that the independent variable of the number of animal had a positive, significant relationship between the dependent variables of risk aversion and farmers' willingness to insure their animals and that the farmers whose main job was farming had higher risk aversion than others.

Torkamani (2009) studied the impacts of crop insurance on the mitigation of income risk among users in Fars Province. He divided the participants into insured and uninsured groups by simple randomization method and analyzed them by likely certainty equivalent method and the Gini coefficient and the Godin method. The estimation of risk aversion of the studied user showed that insurance changes farmers' attitudes towards risk and reduces their risk aversion. Hashemi et al. (2002) explained risk factors and their impact on broiler farms in which the performance of broiler insurance was studied in simple randomization method. According to the study of mean variance and the distribution of important insurance ratios, especially mean premium of policyholder for each insured chicken, the regions should be classified in terms of risk. Results showed that northern regions of Iran have the lowest mean expected premium and regions like Kerman, Sistan and Balouchestan, Hormozgan, Fars and Tehran pose farmers to the highest risk in terms of poultry insurance. Bard and Bari (2001) believe about risk management process that the main functions of production manager about risk include the identification and measurement of risk sources, identification and evaluation of reasons for risk management, risk recommendations in accordance with users' attitudes towards risk. So, one main component of decision-making analysis under risk conditions is to supply valid knowledge about risk to main decision-makers.In an earlier study, Mark et al. (2002) identified economical risk in livestock feed ration in industrial animal farms in Kenya and found that risk management in livestock feeding is very important and that the costs of feed rations should be considered because price risk of feed ration is of the most important risks.In a study on risk management, Meuwissen et al. (2001) concluded that production and price were the most important sources of production risk for farmers and that farmers had found insurance as the best risk management

strategy. Teweldemedhi and Kafidii (2009) examined the risk management strategies of livestock farms in Namibia with an emphasis on economical factors. They found that most farmers were unaware of the importance of risk management, especially livestock insurance, implying that policy-makers should design training courses for livestock farmers so that they can adopt the best management practices for counteracting risk.

Poultry insurance is obligatory in Iran. Accordingly, all maternal hen and chicken production farms are obligated to insure their chickens and pullets. On the other hand, in addition to the price paid for the chickens, broiler pullet farmers should pay an extra fee for all their purchased chickens as a part of policy-holder's insurance premium, whereas the total premium is paid partly by policy-holder and partly by government. In fact, government pays a part of total premium to support producers, such as fuel subsidies (60%), loan subsidies (37%) and guaranteed purchase. It should be noted that this partial payment of premium by government is paid for other agricultural products too. The insured broiler chickens are insured for 48 days that starts when the chickens leave the farm gate. In this insurance period, if the product is damaged for any reason mentioned in insurance policy, it will be appealable and then, it will be compensated (Dourandish, 2008). Some loss factors covered by insurance include diseases like Newcastle, bronchitis, influenza, yolk sac infection, CRD, and infectious bursal disease and natural disasters like flood, earthquake, and unintentional fire.When a farmer suffers losses by any of these causes and his/her chickens start dying, he/she can refer to the closest branch of Agriculture Bank to fill out the loss statement request form. Then, the form is registered in an insurance affiliate triggering the loss assessment process (Insurance Fund Procedure, 2009). Loss assessment agent visits the farm every day to count the number of deaths and to destroy them. At the same time, he/she evaluates all farming processes delicately to note the faults. In this sense, the Agricultural Insurance Fund has prepared a list of managerial factors in which the requirements of building, equipment, disinfection, vaccination and so on are described in details. If these requirements are not met completely, a part of indemnity will be subtracted as managerial factor. These managerial factors can solve a fault in a part of farm which will, in turn, improve the performance and will mitigate the risk.

The present work examines the insurance of poultry farm and its impact on farm risk management. The hypothesis of this study is that risk management has a positive relationship with the insurance and technical factors. The main objective is to study the role of insurance in risk management in broiler chicken farm in Rudbar in Guilan Province, Iran. It aims at assessing the impact of insurance on broiler pullet farms.

Materials and Methods

Since the main objective of the present study was to examine the role of insurance in risk management in broiler farms of Roudbar County and the effect of managerial factors on the improvement of broiler production units in this county, a descriptive-analytical-causative expose facto methodology was adopted. This study using stepwise regression method, because of the known relationships between the variables and the clear description of the data.Descriptive studies can be divided into library, observational and survey research in terms of data collection method. The survey was the research methodology used for data collection, so it can be categorized as a field study.Given the role of insurance in risk management in broiler chicken farms of Rudbar, the subject area covers all broiler chicken farms of this city.Since several variables were included in the study, the sample size was determined by Bartlett Table, Bartlett test is a test of adequacy of samples for an explorative causal analysis. After explorative factor analysis by SPSS Software Package, the calculations for Bartlett test and the adequacy of the model emerges as the first output. so that 55 farms were selected out of 121 broiler farms that were active in Rudbar for which first the list of active farms was gotten from Livestock Deputy of the Jahad-e Agriculture Organization.

Then, after sampling, a questionnaire about the role of insurance in farm risk management was administered to the participants.Data were descriptively analyzed by frequency, percent, mean, and standard deviation, and were inferentially analyzed by Pearson and Spearman correlation coefficients. Then, multiple regression was used to estimate the prediction of variations of a variable with other variables, so that the strongest variables were included in the equation one by one until the error of significance test reached 5%. All analyses were carried out with SPSSVer.21 Statistical Software Package.

Results and Discussion

At the first stage, the samples were descriptively studied. Poultry farmers' demographic information shows that the education level was nominally at four levels of elementary school, under-diploma, diploma, and academic degree. According to Table 1, most participants (20 people, 36.4%) were under-diploma and the lowest frequency was for those with academic degree (9 people, 16.4%). Results for poultry farm capacity indicated that most farms had the capacity for raising 5,000-15,000 chickens and that the capacity of >46,000 chickens had the least frequency. Also, results for farmers' experience in poultry farming reveals that the experience category of 16-30 years had the highest frequency (50.9%) and the category of 31-45 years had the lowest one (3.6%).

Factors affecting risk management

According to Table 2, among statements asking about hygiene index, respondents showed that 'having disinfection basin' had the highest mean of 2.92. The second rank was devoted to 'carcass destruction' with the mean of 2.67, and 'uniform hatching' and 'birdseed exchange with other farms' were ranked the third with the mean of 2.63. Among statements asking about technical factors, respondents gave the first rank to 'poultry cultivation salon type' with the mean of 2.9. The statements of 'heating system type' and 'ventilation method' were ranked the second

Table1
Poultry farmers' demographic information

Variable	Categories	Frequency	Percentage
Educational level(years)	Elementary school	12	21.8
	Under-diploma	20	36.4
	Diploma	14	25.5
	Academic degree	9	16.4
Farm capacity	5,000-15,000	31	56.4
	16,000-25,000	14	25.5
	26,000-35,000	7	12.7
	36,000-45,000	2	3.6
	>46,000	1	1.8
Farming experience (year)	1-15	25	45.5
	16-30	28	50.9
	31-45	2	3.6

Table2
Frequency distribution of risk management indices on the basis of participants' responses to the questionnaire in poultry farm site

Index	Statements	Mean	SD
Hygiene factors	Having disinfection basin	2.92	0.74
	Carcass destruction method	2.67	0.72
	Birdseed exchange with other farms	2.63	0.88
Technical factors	Poultry cultivation salon type	2.9	0.84
	Heating system type	2.58	0.71
	Ventilation method	2.49	0.69
Feeding factors	The application of imported concentrate + corn and soybean	3.63	0.96
	The application of domestic concentrate + corn and soybean	3.09	0.84
	The application of ready-to-feed pallets	2.47	0.79
Insurance factors	The time lag between loss and visit by insurance experts	3.87	0.88
	Concordance between premium and indemnity	2.56	0.78
	Insurance company's commitment	3.52	0.92

Table3
Pearson correlation coefficients and the significance level of variables

Variable	Pearson coefficient	Significance level
Hygiene factors	-0.273*	0.04
Nutrition factors	-0.366**	0.006
Disease prevention actors	-0.279*	0.039
Technical factors	-0.313*	0.02
Insurance factors	-0.339*	0.011
Experience	-0.259	0.066
Farm capacity	0.398**	0.003
Education level	-0.036 (Spearman coefficient)	0.795

and third with the mean of 2.58 and 2.49, respectively. With respect to feeding factors, 'the application of imported concentrate + corn and soybean' was ranked the first with the mean of 3.63, and 'the application of domestic concentrate + corn and soybean' and 'the application of ready-to-feed pallets' were ranked the second and third with the mean of 3.09 and 2.47, respectively. Among statements asking about insurance index from respondents' perspective, 'the time lag between loss and visit by insurance experts' gained the highest mean of 3.87 followed by 'concordance between premium and indemnity' with the mean of 3.56 and 'insurance company's commitment' with the mean of 3.49.

It can be said that the highest frequency of 51 was devoted to farm veterinarian (92.7%) among disease diagnosis statements. Among statement of culture test and antibiogram to determine sensitive antiobiotics, 51 people (92.7%) chose 'yes' choice. Among statements about the methods of using disinfecting medications, chicken overhead spray was selected by 36 people (65.5%). Among statements about how to use medications and disinfection materials, 'under farm veterinarian supervision' had the highest frequency of 52 people. Only one respondent gave a negative reply to the statement about using chicken card for registering its history.

Correlation analysis

According to Table 3, Pearson coefficient revealed a significant relationship between production risk and the variable of hygiene factors from poultry farmers' perspective at the 0.05 level ($r = -0.273$; $p = 0.04$). So, it can be said that production risk had a negative, significant correlation with hygiene factors. Also, a negative, significant correlation was found between production risk and the variable of technical factors from farmers' perspective ($r = -0.313$; $p = 0.02$) at the 0.05 level. Pearson coefficient was estimated to be $r = -0.366$ and $p = 0.006$ for production risk and the variable of nutrition from farmers' perspective showing a significant relationship at the 0.01 level. Hence, it can be said that production risk was negatively and significantly correlated with nutrition index. The relationship between production risk and insurance variable was also found to be significant at the 0.05 level ($r = -0.33$; $p = 0.011$), implying a negative, significant correlation between them. Pearson coefficient estimated for production risk and the variable of disease prevention showed that a significant relationship at the 0.05 level ($r = -0.273$; $p = 0.039$). It can be inferred that production risk was negatively and significantly correlated with disease prevention index. Pearson coefficient showed a significant

Table4
Regression table of dependent variable (risk management)

Independent variable		B	Beta	T	P
Y	Production	-	-	-	-
Constant	Constant	358.66	-	6.131	0.000
X_1	Farm capacity	20.322	0.302	2.889	0.006
X_2	Prevention factors	-2.036	-0.307	-3.05	0.004
X_3	Technical factors	-2.889	-0.202	-1.955	0.046
X_4	Insurance factors	-1.666	-0.255	-2.495	0.016
X_5	Hygiene factors	-4.669	-0.275	-2.702	0.009
X_6	Nutrition factors	-5.371	-0.254	-2.42	0.019

relationship between production risk and farm capacity (r = 0.398; p = 0.003) at the 0.01 level, showing a significant, positive correlation between them. Spearman coefficient indicated that there was no significant relationship between farmers' education level and production risk (r = -0.03; p = 0.795) from farmers' perspective. Pearson coefficient showed an insignificant relationship between job experience and production risk (r = -0.259; p = 0.066) at the 0.01 level, implying that risk management is not correlated with job experience from respondents' perspective.

Predictive model of independent variables vs. production risk

The present work applied multiple regression to predict poultry farmers' opinions about the role of risk management for which SPSSver.21 was used to find the equation. So, risk management was considered as the dependent variable and all factors that showed significant relationship with risk management in Pearson correlation test were included as the independent variables in the stepwise regression test. Regression analysis proceeded for six steps. At the first step, capacity whose correlation coefficient was R = 0.398 with dependent variable was included in the equation. The determination coefficient was estimated to be R2 = 0.158 at this step. It implies that poultry farm capacity, alone, can determine 0.158 of risk management variations. At the second step, prediction factors were included in the equation. Technical factors were the third variable included in the equation, and at the four step when insurance variable was included, correlation coefficient was increased to R = 0.634 and determination coefficient to R2 = 0.402. At the fifth step, hygiene factors were included in the equation giving rise to R = 0.682 and R2 = 0.465. Finally, it was nutrition factors' turn to be included in the question at the six step which resulted in correlation coefficient of R = 0.723 and determination coefficient of R2 = 0.523.

Standardized regression impact factor (Beta) showed that poultry farm capacity with 0.302 had the highest regressive impact on accounting for risk management variations. The next ranks were for prevention, hygiene, insurance, nutrition, and technical factors in the order of importance.

The regression equation to account for risk management was written as follows for values given in Table 4:

F=68.42 R2 =89.11

According to the results, a negative, significant relationship was revealed between risk management and hygiene factors, which is consistent with Amini et al. (2002) and Jakinda and Luoch-Kosura (2006). Also, risk management was related to technical factors negatively and significantly, which is in agreement with Kiani Rad and Yazdani (2003) and Tafazzoli Harandi (2002).

Production risk was significantly related to insurance performance and prevention factors at the 0.05 error level. It was related to nutrition factor and farm capacity at the 0.01 error level too.

Recommendations

According to the findings, the following recommendations can be drawn:

• It is recommended to identify insurable risks at each step of farming by a provincial workgroup and to make insurance by policies specific to that step considering insurable risks.

• Given the fact that most poultry farmers are poorly-educated and that it is necessary to apply sound management practices for controlling and mitigating the losses, it is recommended to hold extension-educational courses by experts to teach sound management of poultry farms.

• Given the fact that it is impossible to cover all loss causes by insurance and that there is a need to determine if the losses are really caused by damaging events, it is recommended to make plans for fulfilling income insurance plan.

• It is recommended to insure chickens in chicken cultivation salons at provincial level so that it is made possible to monitor the insurability and the validity of insured chicken number and to match them with farm conditions.

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