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Attitudes of Producers Toward Livestock Insurance in Broiler Industry in Jordan

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Abstract: The aim of this study was to evaluate producers' attitude towards livestock insurance in Jordan. A 100 broiler producers were surveyed. All the country governorates were resembled in the sample. The collected data covered an average of six production cycles with an average of 7500 birds per cycle. Producers' attitudes regarding livestock insurance was measured by producers ratings on a Likert-type scale. Five point Likert type scale with ratings on a 10 item Likert-type questions was used. The ratings ranged from 1-5 (strongly agree). A numerical value was assigned to each potential choice and a mean figure for all the responses was computed. The final average score represents overall level of broiler producers' attitude toward livestock insurance in Jordan. Results revealed that the producers' overall mean score for attitude was 3.31, indicating a positive attitude toward the adoption of livestock insurance. The results revealed a strong relationship between the preference of the producers that the livestock insurance should not be compulsory and the importance of livestock insurance in helping the damaged producers with the acceptance of livestock insurance by the broiler producers. The expected effect of livestock insurance in reducing the producers stress, the awareness of the broiler producers about livestock insurance benefits, the producers' considerations of livestock insurance as a personal savings, the expected effect of livestock insurance to protect against future fluctuations in production and the expected benefits of livestock insurance to provide equal protection among broiler producers are very important factors in enhancing the positive attitude of the producers toward livestock insurance. Results revealed that producers had a positive attitude towards livestock insurance.

Key words: Producers attitude, broiler industry, livestock insurance, likert-type scale, Jordan

INTRODUCTION

Jordan is a relatively small country situated at the junction of the Levantine and Arabian areas of the Middle East. The country (about 5.7 million populations) is bordered on the north by Syria, to the east by Iraq and by Saudi Arabia on the east and south and to the west is Palestine, while Jordan's only outlet to the sea, the Gulf of Aqaba, is to the south. Jordan occupies an area of approximately, 96,188 km^2.

In Jordan broiler producers have been struggling to maintain their income by continuously trying to increase their production.

Such increased productivity may be associated with increased economic and environmental risk as the production system becomes more vulnerable to risk sources which leads to production (or yield) risk and affects the producers' ability to repay debt and to cover essential living costs for their families. Broiler production industry in Jordan is a very important sector in animal production. The total number of broiler production farms in the year 2008 is 2168 with a capacity of >26 million birds in each production cycle; these farms provide about 120,000 tons of poultry meat for local consumption (MOA, 2008).

It has been proved that agricultural insurance is an effective tool of shifting risk for individuals. Agricultural insurance as a risk handling policy is adopted by many countries to support the domestic agricultural development (Babcock and Hart, 2000). Agricultural insurance has a checkered history (Chamber, 1989). To implement agricultural insurance and enhance the participation rate, many high-income countries, such as USA, Japan, Spain and Italy, have to provide a large scale of financial subsidy for agricultural insurance programs (Goodwin, 2001). The effects of risk events matter for rural lending institutions and agri-businesses, as they determine the risk exposure of borrowers and input providers (Benson and Clay, 1998; Guillaumont *et al*., 1999).

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Broiler producers are not able to predict with certainty the amount of output that the production process will yield due to external factors such as weather, pests and diseases. Broiler producers can also be hindered by adverse events during marketing or processing that may result in production losses (Barnett *et al*., 2005). An effective and timely insurance mechanism might allow people to engage in higher risk/higher return activities without putting their livelihoods at risk (Hess *et al*., 2003).

The aim of this study was to evaluate Jordanian broiler producers' attitudes towards agricultural insurance in Jordan. Broiler producers in Jordan are facing financial losses due to heavy rains, flood, drought, hot weather, inputs price increase, broiler meat prices fluctuations, death of animals etc. No single one of them is participating in any agricultural or any agricultural sector related insurance program. Lack of information about agriculture insurance schemes amongst producers may be the major reason for this situation. All producers are not part of any such schemes.

Importance of agricultural insurance: Historically, agricultural insurance evolved as insurance against hail in France and Germany during the 1820s. In the late 1800s, some farmers in the United States began a hail insurance program due to losses to their tobacco crops. This type of coverage still exists in many countries today. Then in 1938, the United States started a program to protect against a wider range of natural disasters which became known as multi-peril insurance. On some occasions, programs offer protection against price risk. Covered losses can occur to crops, livestock and even aquaculture, such as clams. The scope and coverage of agricultural insurance has been expanded in stages and now includes not only extended hail cover and other natural perils (Devereux, 2004). The features of agricultural insurance regimes in emerging markets vary significantly. For example, well established programmes are in place in the largest Latin American economies (Argentina, Brazil and Mexico), while in Eastern Europe these are not widespread. In Asia and Africa, countries like India and South Africa have long-standing programs while others like Indonesia have no formal regime to speak of. In many markets, agricultural insurance development is linked to credit protection, where coverage is a prerequisite for farm loan application.

Agricultural insurance offers farmers an opportunity to buy protection against potentially large yield or revenue losses. Crop yield insurance, for instance, guarantees the farmer's yield will not fall below a given level by compensating the farmer for any shortfalls, valued at a set price. That is, at planting time, a yield guarantee (usually set at an estimate of average yield) is established and the farmer is offered yield-coverage options specified as percentages of the yield guarantee. Agricultural insurance, which provides indemnification for economic loss resulting from damage to or loss of crops and animals in the event of adverse natural and other phenomena, is a subject of great urgency that must be addressed. Insurance is defined as the equitable transfer of the risk of a loss from one entity to another in exchange for a premium (Morduch, 2004). The agricultural insurance is a kind of policy. When performing the policy, the nation can stabilize national economy foundation and strengthen agriculture protection. So, it does not belong to the category of the business insurance, but a kind of policy insurance (Jiazhi and Lin, 2004).

The concept behind using insurance in risk management is risk pooling. Risk pooling involves combining the risks faced by many individual farmers facing uncorrelated loses who contribute to a common fund via insurance premiums. Any individuals in the pool who experience losses are then compensated for their loss using funds from the common pool. To be successful at risk pooling, insurers must sell policies to many different farmers with uncorrelated (or less than perfectly correlated) risks resulting in a portfolio that is less risky than the individual policies. With uncorrelated risks, the probability of a significant proportion of farmers in the insurance pool having a claim at the same time is very low (Duncan and Myers, 2000).

An inability to understand the importance of agricultural insurance among the government, enterprises and producers was reflected by the fact that neither this insurance was included in the country's overall planning for agricultural development nor had any specific agricultural insurance law been drawn up. Lack of professionals in agricultural insurance and increasing difficulties in identifying risks in broiler production sector in Jordan are other important reasons that made it difficult to initiate and promote agricultural insurance industry in the country. As producers' awareness for insurance increases, they are becoming more eager for agricultural protection. Developing an agricultural insurance system is needed to support and protect the interest of producers. In order to mitigate the inherent risks common to agriculture, farm operators have to use an array of risk management strategies and techniques such as:

1. Crop diversification
2. Maintaining financial reserves
3. Reliance on off-farm employment and income generation

4. Production contracting
5. Marketing contracting
6. Forward pricing
7. Futures options contracts
8. Leasing inputs and custom hiring
9-10. Acquiring product and revenue insurance

Unfortunately, many of the more modern risk management tools (items 4-10) are not widely available or accessible in developing countries including Jordan. In order for modern risk management techniques to materialize, certain market and supply conditions have to be met and appropriate infrastructure, legal/regulatory as well as physical, must be in place (Makki, 2002). Recent financial and technological innovations in the insurance markets could provide alternatives for dealing with agricultural risks, especially as it relates to climatic risk. Capital markets can be part of the financial solution to making agricultural insurance more accessible to producers (Skees *et al*., 2002).

There are three basic types of agricultural insurance programs, the first is a macro-level coverage employing a relatively new instrument called parametric or weather index. This instrument, largely purchased by governments or banks, is designed to protect against catastrophic losses (e.g., hurricanes). A second approach employs the multiperil coverage model developed in such countries as Canada, Mexico and the United States. This model provides protection against crop losses to specific farms. Individual farmers or cooperatives purchase this coverage. The third tool is called micro-insurance. As the name implies, this protection is for the smallest of individual farmers. It basically uses the same model as micro credit (David, 2008).

Risks in broiler production: The livestock sub-sector is one of the main constituents of the agricultural sector in Jordan, which contributes about 60% of the agricultural output and provides a major source of income to 250,000 people. The contribution of the different sectors of livestock to the agricultural produce is variable. While the poultry sector occupies the highest rank, followed by dairy cattle, the small ruminant sector has a special importance due to its social significance. The production of poultry meat and eggs satisfies the consumption need with periodic surpluses as the productive capacity exceeds the local market need. In 2008, the broiler production sector included 2168 broilers farms. In Jordan the northern and southern parts of the country considered to be with high level of risk for broiler production, the middle region is with low level of risk and more suitable for broiler production. More than 60% of broiler farms in Jordan are located in regions with high levels of risk (North and South of the country), 40% of the whole broiler farms in the country are within the low risk region (Middle) (Al-Desiet and Al-Sharaft, 2009).

Table 1: Agricultural risks

Factors	Risks
Climatic	Hail, frost, drought, flood, wind, fire, snow, ice, etc.
Sanitary	Plagues and diseases
Geological	Earthquakes, volcanic eruptions, etc.
Market	Domestic and international prices variability and changes in quality standards
Man made	War, financial crisis, collapse of legal institutions, etc.

Zorrilla (2002)

Risk is an unavoidable but manageable element in the business of agricultural production and marketing. Agricultural production can vary widely from year to year due to unforeseen weather, disease/pest infestations and/or market conditions causing wide swings in yields and commodity prices (Agroasemex, 2002). Table 1 provides, a list of the types of risks common in agriculture (Zorrilla, 2002).

Risks and hazards associated with production is part of the business environment in broiler production industry. Effective recognition of hazards and informal assessment of risk has long been the basis of progress in the industry (Ahl and Buntain, 1997).

The decision to buy insurance against risk in agriculture should be an economic one. In making that decision, two factors are critical:

- How much loss can the manager (farmer) withstand without insurance?
- What are the trades-off between insurance costs and potential losses? (Casavant and Infanger, 1984)

Therefore, insurance is more attractive to risk-averse farmers and in situations where risks warrant paying a premium significantly higher than the expected loss without insurance (Hardaker *et al*., 1997). However, in some countries government subsidises premiums, making the purchase of insurance more attractive (Eidman, 1990). Sources of risk in agriculture, as well as broiler production, include production or yield risk, price or market risk, institutional risk and other types of risk like human or personal risks, asset risk, contracting risk and financial risk (Ray, 1981). Various types of risks can be distinguished. The classification of Hardaker *et al.* (1997), who differentiated between business risks and financial risks, can be used for most agricultural and broiler production risks. Business risks include production risks, which are related to the unpredictable nature of the weather. These risks affect all kinds of production in agriculture. Broiler production sector is one of these

Table 2: Risk management strategies in agriculture

Informal mechanism		Formal mechanisms	
Strategies	Arrangments	Market based	Publicly provided
Ex-ante strategies			
On-farm	1. Avoiding exposure to Risk. 2. Crop diversification and intercropping. 3. Plot diversification. 4. Diversification of income source. 5. Buffer stock accumulation of crops or liquid assets. 6. Adoption of advanced Cropping techniques (fertilization, irrigation, resistant varieties).		1. Agricultural extension 2. Pest management systems 3. Infrastructures (roads, dams, Irrigation systems).
Sharing risk with others	1. Crop sharing. 2. Informal risk pool.	1. Contract marketing and futures contracts. 2. Insurance.	
Ex-post strategies			
Coping with shocks	1. Sale of assets. 2. Reallocation of labor. 3. Mutual aid.	Credit	1. Social assistance. 2. Social funds. 3. Cash transfer.

Anderson (2001), Townsend (2005) and World Bank (2001)

kinds. Broiler production risk is associated with negative outcomes that stem from imperfectly predictable biological, climatic and price variables. These variables include natural adversities (for example, pests and diseases) and climatic factors not within the control of agricultural producers. They also include adverse changes in both input and output prices (Harwood *et al*., 1999).

The concept behind using insurance in risk management is risk pooling. Risk pooling involves combining the risks faced by many individual farmers facing uncorrelated loses who contribute to a common fund via insurance premiums. Any individuals in the pool who experience losses are then compensated for their loss using funds from the common pool (Duncan and Myers, 2000). Several strategies could be used by producers to deal with risk. These strategies include both informal and formal mechanisms. As highlighted in the 2000/2001 World Development Report (World Bank, 2001), informal strategies are identified as arrangements that involve individuals or households or such groups as communities or villages, while formal arrangements are market-based activities and publicly provided mechanisms. Table 2 summarizes risk management strategies in agriculture.

MATERIALS AND METHODS

Survey and data collection: The study covered the whole broiler production areas in Jordan, all the country governorates were resembled in the sample. The study areas were divided into three major production regions. They are the northern, middle and southern regions of the country (Table 3). The total number of broiler farms in the three regions of production is 2168 (MOA, 2008) from these the sample was chosen. A sample survey of 100 commercial broiler producers was conducted. A questionnaire was constructed to collect the necessary data. Socio-economic, production, technical, Producers' related information and other factors were included in the questionnaire. The collected data covered an average of six production cycles with 5000-10000 birds per cycle (The average was 7500 birds) covering a one year period (2008). This capacity is the most dominant in the three areas of broiler production in Jordan. The questionnaire was pilot tested with 25 broiler producers who were not included in the sample.

Table 3: Number of the broiler birds and farms in Jordan

Farm capacity class	No. of birds	No. of farms
<5000	736763	360
5000-9999	3777880	828
10000-14999	3790185	452
15000-29999	4367163	336
>30000	8336250	192
Total	21008241	2168

MOA (2008), Jordan

Sample size: One hundred producers were interviewed throughout the country, the sample size was determined according to the following equation:

$$n = [(p \times q \times z^2)/e^2]/[(N \times e^2) + (z^2 \times p \times q)/(N \times e^2)]$$

Where:

n = Sample size
p = The proportion that the sample will occur
q = The proportion that the sample will not occur = (1- p)
z = The standardized score
e = Error term
N = Population

The sample size was determined at a confidence level of 0.90; this level was an appropriated level due to the reason that the population itself was relatively small in size. The term error was 0.10 and the Z value correspondent to this level is 1.65, the proportion that the sample will occur was 0.50 and proportion that the sample will not occur was also 0.50 and the population was 2168. The sample size according to the above mentioned equation was 66. Additional 34 producers, distributed equally on the three regions (11 each except the northern region 12 additional producers interviewed), were interviewed for precession and certainty purposes. The total number of the interviewed producers was 100. The Table 4 shows, the number of producers interviewed in each area of the three production areas in Jordan.

The analysis tool: Producers' attitudes regarding livestock insurance was measured by farmer ratings on a Likert-type scale. Likert-type scale is an attitude measuring instrument frequently used in persuasion studies. Likert scale is a psychometric scale commonly used in questionnaires and is the most widely used scale in survey research. Likert scale is a method of ascribing quantitative value to qualitative data, to make it amenable to statistical analysis. Used mainly in training course evaluations and market surveys, Likert scales usually have five potential choices (strongly agree, agree, neutral, disagree, strongly disagree) but sometimes go up to ten or more. A numerical value is assigned to each potential choice and a mean figure for all the responses is computed at the end of the evaluation or survey. The final average score represents overall level of accomplishment or attitude toward the subject matter. Likert scale named after its inventor, the US organizational-behavior psychologist Dr. Rensis Likert who published a report describing its use. When responding to a Likert questionnaire item, respondents specify their level of agreement to a statement. It is one of the most popular methods of measuring attitudes. It depends on the method of summated ratings (Vagias, 2006). In this scale, an attitude statement is given and the respondent then makes a scale reflecting his or her attitude to the statement.

Methodology: In order to determine producers´ view and their attitude related to the adoption of livestock insurance five point Likert type scale was used. Ratings on a 10 item Likert-type questions were used. The ratings ranged from 1 (strongly disagree) to 5 (strongly agree) as follows:

Table 4: Number of producers interviewed in production areas every season

Area of production	Total no. of farms	Compared to country farms (%)	Interviewed
Producers*			
North	1025	47.3	47
Middle	814	37.5	38
South	329	15.2	15
Total	2168	100.0	100

*Calculated by the researchers

Table 5: Statements used to measure producers´ attitudes toward livestock insurance

Statement no.	Statement
1	Livestock insurance should not be compulsory
2	Livestock insurance is to help damaged Producers
3	Livestock insurance reduces my stress
4	I am aware of livestock insurance benefits
5	Livestock insurance is a personal savings
6	Livestock insurance protects against future fluctuations in production
7	Livestock insurance provide equal protection among broiler producers
8	I prefer government to handle livestock insurance plans
9	I prefer private sector to handle livestock insurance plans
10	Livestock insurance will make broiler production easier

Mojarradi *et al.* (2008)

- Strongly disagree
- Disagree
- Neither agrees nor disagrees
- Agree
- Strongly agree

Table 5, shows the main statements used in the questionnaire regarding the producers´ attitudes toward livestock insurance.

RESULTS AND DISCUSSION

Table 6 shows, the mean score by question in rank order as well as the overall level of attitude toward livestock insurance. The mean score of the items in the scale represent the producers' attitude towards livestock insurance.

Results revealed that the producers' overall mean score for attitude was 3.31, indicating a positive attitude toward the adoption of livestock insurance. Producers rated the following two statements with the highest agreement: Livestock insurance should not be compulsory (mean = 4.41), Livestock insurance is to help damaged Producers (mean = 4.39). The statements which received the lowest agreement were: I prefer private sector to handle livestock insurance plans (mean = 1.98) and Livestock insurance will make broiler production easier (mean = 1.54). The results revealed a strong relationship between the preference of the producers that the livestock insurance should not be compulsory and the importance of livestock insurance in helping the damaged producers

Table 6: Producers' attitude toward livestock insurance

Statement	Frequency	Mean ranking	SD	Rank
Livestock insurance should not be compulsory	99	4.41	1.14	1
Livestock insurance is to help damaged Producers	98	4.39	0.93	2
Livestock insurance reduces my stress	100	4.14	0.96	3
I am aware of livestock insurance benefits	100	3.88	0.79	4
Livestock insurance is a personal savings	100	3.64	0.72	5
Livestock insurance protects against future fluctuations in production	100	3.22	0.84	6
Livestock insurance provide equal protection among broiler producers	97	3.10	0.97	7
I prefer government to handle livestock insurance plans	100	2.44	1.02	8
I prefer private sector to handle livestock insurance plans	96	1.98	1.43	9
Livestock insurance will make broiler production easier	98	1.54	1.27	10

Overall attitude toward livestock insurance = 3.30, Scale: 1 = Strongly disagree, 5 = Strongly agree

with the acceptance of livestock insurance by the broiler producers. The expected effect of the livestock insurance in reducing the producers stress, the awareness of the broiler producers about livestock insurance benefits, the producers' considerations of livestock insurance as a personal savings, the expected effect of livestock insurance to protect against future fluctuations in production and the expected benefits of livestock insurance to provide equal protection among broiler producers are very important factors in enhancing the highly positive attitude of the producers toward livestock insurance. These factors increase the probability of livestock insurance adoption by the producers. The factors with the lowest effect in determining the producers' attitude toward livestock insurance are: who will manage the livestock insurance plans (public or private) and the expected effect of the livestock insurance to make the production process easier.

Since, the results of the study showed a strong positive attitude from the broiler producers in Jordan to adopt livestock insurance it is recommended that the government should improve legislation to provide a sound legal environment for the development of this kind of insurance. Second, it is suggested that the laws and regulations on agricultural insurance in general and livestock insurance in particular should lied down as soon as possible to ensure constant government support for this undertaking. Third, the government should make more efforts to raise farmer's insurance awareness and foster grassroots insurance professionals to understand the nature, role and advantage of agricultural insurance. The government should try to organize farmers on a voluntary basis to participate in agricultural insurance.

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