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Short Communication

Risk management of importation of day old chicks in Khartoum State, Sudan

Marwa ElTayeb Abdel Rahman[1], Atif Elamin Abdelgadir[2]* and Mahmoud Musa Mahmoud[2]

[1]Ministry of Animal Resources and Fisheries, Khartoum, Sudan.
[2]Department of Preventive Medicine and Public Health, Faculty of Veterinary Medicine, University of Khartoum, Khartoum, Sudan.

The present study was carried out in Khartoum state comprising three towns namely Khartoum, Omdurman and Khartoum North and was aimed of identifing, analyzing and dealing with risks related to importation of day old chicks in order to minimize risk impact and to develop systemic approach for approving or rejecting imported day old chicks according to processes of import policy and procedures. Data was obtained from Ministry of Animal Resources, Fisheries and Rangelands (MARFR), Sudanese Standards and Metrology Organization (SSMO), quarantine at the air port as well as from commercial companies which import day old chicks to Khartoum state. The respondents were decision markers and veterinarians who were working in these areas. Data about risk management related to importation of day old chicks was collected by means of questionnaires. The total respondents by questionnaire were 60 veterinarians. Data was analyzed using SPSS frequencies and percentages. The results showed that 75% of the respondents at Khartoum International Airport (KIAP) explained that there was no updating for their knowledge as well as there was no source for getting information 55 % responded that internet access was very limited. Most of them (80%) gave negative responses for the issue of submission of the samples to the laboratory. It was found that in the M A R F R the respondents confirmed the presence of import regulations but the implementation was good to some extent, as well as the quarantine measures at the airport were less than adequate. Veterinarians belonging to SSMO confirmed the presence of standards. In contrast, they were not convinced with the proper implementation of the Sudanese standards. Quarantine measures and laboratory diagnosis at the airport were less than perfect. The results showed that 85% of respondents in the companies knew about risk, 60% updated their knowledge, 100% confirmed of mortality causes and 75% related the risk to laboratory procedures.

Key words: Risk management, importation, day old chicks, Sudan.

INTRODUCTION

In the recent past, the poultry industry in Sudan has greatly expanded and became an economically important

source of income for many people in the country. Sudan recognized the potential of poultry industry in the early fifties of the last century. Imported breeds were brought to Sudan by both government and the private sector and subsequently farmers recognized the potential of including poultry production in their farms; this was further accelerated by urbans after the country's independence in 1956. As a result, importing of day old chicks dramatically increased in recent years. For instance, in the last four years the number of imported day old chicks has been estimated to be 30,000 chicks from eight countries. Hence, the poultry industry sector has become very crucial to domestic growth product (DGP) of the country, with its considerable participation in food security which has depended mainly on livestock and poultry.

As a consequence, this allowed the importation of huge numbers of poultry and poultry products in the country. However, this may increase the possibility of importing infectious trans-boundary diseases or any other diseases to the country. A list of several diseases has been identified by the World Organization for Animal Health (OIE), particularly diseases imported by day old chicks. However importation of day old chicks involved a degree of disease risk to the importing country (OIE, 2010). Therefore, knowledge of import risk analysis is necessary to provide importing countries with an objective and defensible methods for assessing the risks associated with the importation of day old chicks. This information is required for exporting country in order to set certain conditions for accepting or refusing the imported poultry or poultry products (OIE, 2011). To achieve this, well trained personnel as veterinarians are essential to investigate and respond to new threats and meet the global, regional and national levels (OIE, 2009).

Ensuring entry of healthy birds following rigorous inspection in an importing country will protect the country from significant economic losses. For instance, the case of the avian influenza outbreak that happened in the Sudan which was claimed to be spread from the neighboring countries that caused heavy losses in the poultry industry for many poultry companies and individuals. Thus, risk management of day-old chicks imported as a preventive measure to provide the importing country and importers with information to avoid financial losses applied according to global and local laws is necessary. This study aims to:

1. Identify major risks related to importation of day old chicks in Khartum;

2. Analyze importance of these risk factors and;
3. Develop a system for approving or rejecting importation of day old chicks in terms in line with existing policy and procedure in the country.

MATERIALS AND METHODS

Study site

The study was conducted in Khartoum state which comprised three towns namely; Khartoum, Omdurman and Khartoum north. The source of data of current research work was as follows.

Khartoum International Airport (KIAP)

KIAP is the main international airport in Sudan which is situated in 15° 35' 22" north (latitude) and 32° 33' 11" East (longitude) and elevation of 1255 (386 m) about sea level. KIAP is used for both civil and military purposes. The Ministry of Animal Resources, Fisheries and Rangelands (MARFR) is responsible for national animal health matters including quarantine, disease control, reporting, and import and export certification of animals and their products, while Sudanese Standards and Metrology Organization (SSMO) is a scientific monitoring body which coordinates inspection of the imported consignments of hatching eggs and day old chicks.

Questionnaire survey

Data was obtained from the MARFR and SSMO, as well as from private commercial companies which import day old chicks. Data about risk management related to importation of day old chicks was collected by means of a questionnaire.

Target respondents

Responses to questionnaire were obtained from decision markers in MARFR, the veterinarians who are working in the quarantine at KIAP, veterinarians who are working at SSMO and veterinarians who are working with commercial companies which import day old chicks in Khartoum state. Target respondents are presented in Table 1.

Sampling strategies

Data was collected from non-probability sampling methods based on willingness and support of respondents (that means not all the veterinarians in the study site had the same chance for being selected for responding to the questionnaire.

Data analysis

Data related to risk management was analyzed using IBM SPSS statistics version 20. Descriptive statistic such as frequency (count) and percentage was used and presented either in table or bar chart. No analytical statistic was done for data because there was no standard or basic variable for making such analysis as well as some time the required sample size was too low. This method of analysis was selected as statistical descriptive proportion to the small size of the sample under study and the lack of statistical distribution. The sampling is not valid compared to the value calculated and the theoretical value, as in the case of Chi-Square test descriptive method which relies on the study of fact or phenomenon, as this kind of surveys is the appropriate style to gather information about the problem or what its purpose and the

Table 1. Description of the target respondents such as veterinarians in the study site. Their level of education and professional experience is observed.

Unit	Target respondent veterinarian	
	Frequency	**Percentage**
Ministry of Animal Resources, Fisheries and Rangelands (MARFR)		
A. Qualification		
Bachelor of sciences	6	42.9
Master sciences	8	57.1
PhD	0	0
Sub-total	14	100
B. Experience		
< 5 years	1	7.1
5-10 years	3	21.4
>10 years	10	71.4
Sub-total	14	100
Khartoum International Airport (KIAP)		
A. Qualification		
Bachelor of sciences	14	70
Master of sciences	6	30
PhD	0	0
Sub-total	20	100
B Experience		
< 5 years	2	10
5-10 years	11	55
>10 years	7	35
Sub-total	20	100
Sudanese Standards and Metrology Organization (SSMO)		
A. Qualification		
Bachelor of sciences	2	33.3
Master of sciences	4	66.7
PhD	0	0
Sub-total	6	100
B. Experience		
< 5 years	1	16.7
5-10	3	50
>10	2	33.3
Sub-total	6	100
Companies which imported day old chicks		
A. Qualification		
Bachelorof sciences	16	80
Master of sciences	4	20
PhD	0	0
Sub-total	20	100
B. Experience		
< 5 years	8	40
5-10	7	35
>10	5	25
Sub-total	20	100

Table 2. Questionnaire survey responses related to knowledge of risks by Veterinarians at Khartoum International Airport.

Unit	Veterinarian	
	Frequency	Percentage
Updating of the knowledge		
Yes	5	25
No	15	75
Source of the knowledge		
References and journals	1	5
Internet	6	30
Reports	2	10
Nothing	11	55
Frequency for updating of the knowledge		
1-Daily	5	25
2-Weekly	1	5
3-Monthly	5	25
4-More than one month	9	45
Availability of internet at work		
Yes	4	20
No	16	80
Constrains for getting information		
Yes	13	65
No	7	35
Time for last training		
Last month	1	5
Last three month	0	0
Last year	8	40
Nothing	11	55
Participation in conferences		
Local	0	0
International	2	10
Nothing	18	90
Presence of regulation		
Yes	18	95
No	1	5
Knowledge about regulation		
Yes	17	85
No	3	15

The total number of respondents were 20. There was one missing value.

strengths and weaknesses in order to reach conclusions about the validity of this situation to reach partial or radical changes.

RESULTS

The study was conducted in Khartoum state for the purpose of risk management related to import of day old chicks. The methodology was mainly based on collection of data by means of questionnaire using non-probability sampling methods. Respondent veterinarians who were working at KIAP explained that there was no updating for their knowledge 75% (n = 15) as well as there was no source for getting information 55% (n = 1), and internet access was very limited. However, they confirmed that the presence of regulation related to importation of day old chicks the rest of the results are presented in Table 2. Most of them gave negative response for the issue of submission of the samples to the laboratory 80% (n = 16).

All respondents stated that the presence of good laboratories for doing research, leaflets and training were the best solution against the hazards associated with importation of day old chicks (Table 3). Information with regard to precautions for consignments and transportation and the role of SSMO are presented in Figures 1 to 3. On the other hand, the decision makers in MARFR confirmed the presence of regulations and continuous updating 100% (n = 14) while implementation of the regulations were acceptable to some extent 64.3% (n = 9), as well as quarantine measures at airport were less than average 42.9% (n = 6). Information associated with knowledge and training are shown in Table 4. Most of the decision makers 92.9% (n = 13, out of 14) considered that co-ordination and communication between were very important, however, they did not give attention for monitoring commercial companies. Furthermore, the veterinarian of SSMO confirmed the presence of standards 100% (n = 6). In contrast they did not consider implementation of the Sudanese standards, quarantine measures and laboratory diagnosis at the airport (Table 5) as adequate. All of them 100% (n = 6) stated that more attention should be given to the presence of good laboratory work, training and implementation of standards which are important. The rest of the information on risk management that is associated with importation of day old chicks is presented in Table 6.

Good responses were recorded by veterinarians in companies with regard to knowledge about risk 85% (n = 17, out of 20) and those that wish to update their knowledge 60% (n = 12, out of 20). The same responses were obtained for determination of mortality causes and confirmation of the risk using laboratory procedure (100 and 75%, n = 20 and 15, out of 20, respectively (Table 7). The rest of the results are summarized in Figures 1 to 3.
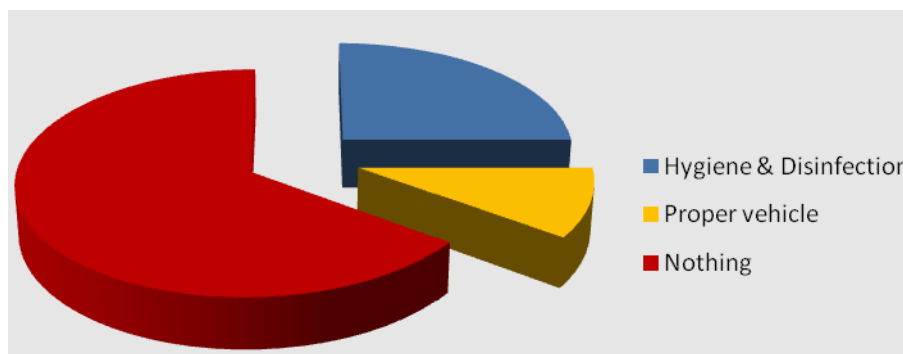
Figure 1. Questionnaire survey responses related to transportation responses by Veterinarians at Khartoum International Airport.
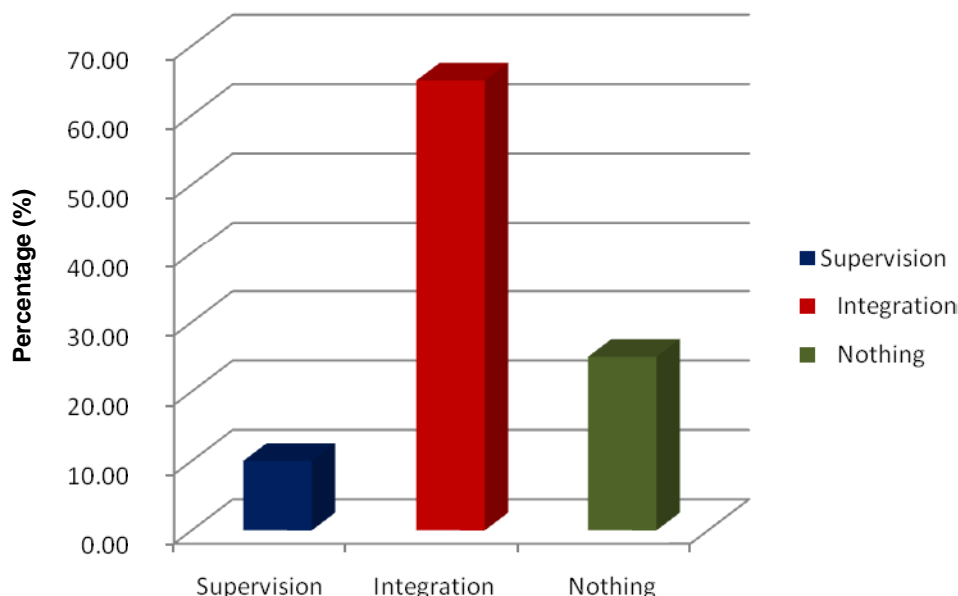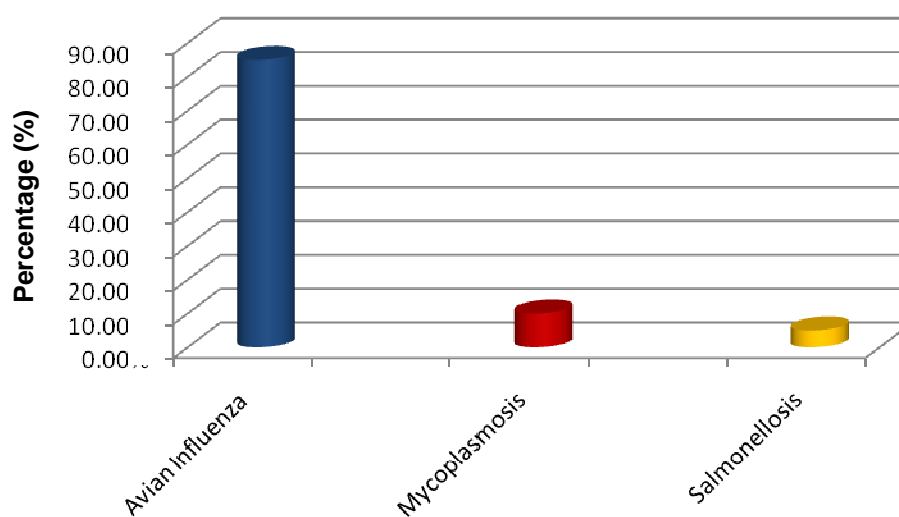

Figure 2. Questionnaire survey responses related to relationship between Sudanese Standards and Metrology Organization and Veterinarians in the quarantine at Khartoum International Airport.

DISCUSSION

This study was designed to identify, analyze and plan response to risks related to importing day old chicks in order to minimize risk impact and to develop systematic approach for approving or rejecting imported day old chicks according to regulation. Khartoum International Airport is the only entrance of the day old chicks and it can be controlled easily. Risk management is based on prevention strategy. The correction of such risks will cause major losses. The results of a quarantine at air port showed that 100% of the respondents release imported chicks without follow up. The chicks must be kept in the vicinity of the quarantine premises, and buildings and management must be of a high standard according to Ashton (1984).

For considering the development and implementation as legislation of the OIE tool for the evaluation of performance of veterinary services OIE (2010), we found that Ministry of Animal Livestock results showed that 57.1% of the respondents had no obligation for quarantine. According to Berier and Abdelgadir (2011) who stated that the SSMO has standards for day old chicks, these have not observed scientific measures based on risk

Figure 3. Questionnaire survey responses related to imported diseases by Veterinarians at Companies importing chicks.

Table 3. Questionnaire survey responses by decision makers with regard to the regulations of importation of day old chicks.

Unit	Veterinarian	
	Frequency	**Percentage**
Presence of regulations		
Yes	14	100
No	0	0
Implementation of regulations		
Excellent	2	14.3
Good	10	71.4
Acceptable	2	14.3
Poor	0	0.0
Updating of regulations		
Yes	14	100
No	0	0
Quarantine measures at airport		
Yes	6	42.9
No	8	57.1
Quarantine measures related to suspected cases		
Yes	11	78.6
No	3	21.4
Strategies for dealing with risks		
Yes	8	57.1
No	6	42.9

Table 4. Questionnaire survey responses by decision makers regarding knowledge and training at MARFR.

Unit	Veterinarian	
	Frequency	**Percentage**
Availability of training		
Yes	5	35.7
No	9	64.3
Availability of conferences		
Yes	1	7.1
No	13	92.9
Efforts for providing information		
Yes	7	50
No	7	50
Periodical meeting of related committee		
Yes	14	100
No	0	0
Presence of reporting system		
Yes	8	57.1
No	6	42.9

Table 5. Questionnaire survey responses by veterinarian of Sudanese Standards and Metrology Organization (SSMO) regarding importation of day old chicks.

Unit	Veterinarian	
	Frequency	**Percentage**
Presence of standards		
Yes	6	100
No	0	0.0
Quarantine measures at airport		
Yes	0	0.0
No	6	100
Laboratory diagnosis		
Yes	0	0.0
No	6	100
Handling of imported chicks		
Release	6	100
Release and follow-up	0	0.0
Implementation of Sudanese standards		
Yes	4	66.7
No	2	33.3
Role of veterinarians regarding standards		
Implementation of standards	6	100
Supervision	0	0.0

Table 6. Veterinarian responses to possible identification and management of the risk related to importation of day old chicks at SSMO.

Unit	Veterinarian	
	Frequency	**Percentage**
Presence of risk by Avian Influenza (AI)		
Yes	6	100
No	0	0.0
Risk determination by laboratory		
Yes	4	66.7
No	2	33.3
Importance of transportation		
Yes	6	100
No	0	0.0
Responsibility for risk management		
Only Government	0	0.0
Co-ordination with others	6	100

Tools and aids for controlling risk (Lab, Training, and Implementation of standards) 6 (100%).

Table 7. Questionnaire survey responses by veterinarians at commercial companies related to identification and management of risk.

Unit	Veterinarian	
	Frequency	**Percentage**
Updating of knowledge		
Always	12	60
Sometimes	4	20
Nothing	4	20
knowledge about risk		
Yes	17	85
No	3	15
Dealing with risk		
Control without notification	15	75
Co-ordination with authority	5	25
Determination of mortality causes		
Yes	20	100
No	0	0.0
Confirmation of the risk by laboratory		
Yes	15	75
No	5	25
Consideration of transportation		
To some extend	5	25
Using special vehicle	15	75
Nothing	0	0.0
Monitoring of chicks in farms		
Yes	20	100
No	0	0.0

estimations and sentry measures in place and are less stringent to achieve the appropriate level of protection. It was found that 100% of SSMO had limited standards for chicks importation, while the standards stated that samples should be taken from every consignment to monitor the immune response against only two diseases (Salmonellosis and Mycoplasmosis). OIE listed many other diseases, for example avian influenza (AI), etc. It was also found that 100% of the respondents stated that no lab diagnosis exists. The chicks were released without follow up and all respondents stated that AI is considered to be a high risk and did not list it in the Sudanese standard risk list.

According to the results, 55% of the airport quarantine staff received no training, in addition to 64.3% from the decision makers for Ministry of Livestock, Fisheries and Rangelands which stated that no strategic training was available, in spite that the training of veterinarians must have a high level of quality. There is need to train veterinarians to respond to new threats and to meet the new societal expectations at global, regional and national levels (OIE, 2011).

A quarantine station is very important at Khartoum airport with a lab for sample collection and testing and to compel the companies to put their consignments in it and should provide special transportation for the chicks to avoid disease spread by air. They must use air filters on vehicles and allow follow up by veterinarians working in the airport quarantine to visit importation sites and make sure shipments are disease-free before they distribute chicks to farms scattered in the capital, to avoid becoming a means for the transfer and spread of the disease. 85% of quarantine airport staff agrees with this suggestion.

CONCLUSION AND RECOMMENDATIONS

1. Regulations on chick importation should be made effective
2. The quarantine station and setup laboratory units and professional jobs in the quarantine of Khartoum international air port should be provided.
3. Staff of veterinarians at the airport quarantine should be trained and information on the issue provided.
4. Opportunities for veterinarians to participate in conferences to gain new experiences to develop the work should be provided.

5. Communication and coordination between the different parties or various bodies responsible for risk awareness and management should be provided.
6. Intersectoral approach should be to minimize disease risk.
7. A follow up and reporting system should be created.

Conflict of Interest

The author(s) have not declared any conflict of interests.

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