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RISK ANALYSIS APPROACHES FOR ANIMAL HEALTH

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Summary

Since 1969, risk analysis has emerged as a formal discipline with its namesake journal *Risk Analysis* has been introduces in practice in 1981. While Starr singled out in Science modern technology as a natural focus for the application of risk analysis, Lowrence expended to six the number of areas in which it could be used. Hathawai and others have already defined the associated terminology both in generic sense and in particular reference to animal health and livestock importations.

After these first steps in defining risk analysis, there were four mean approaches regarding risk analysis: the European approach promoted by World Animal Health Organisation based on the model Carvellio – Merkhofer in 1993, the American approach promoted by Codex Alimentarius based on the model of National Academy of Sciences – National Research Centre and the approach of international organizations promoted by World Trade Organization.

This paper has as aim to present a comparative assessment of these three approaches in order to identify the particular field of application for each model of risk analysis and to point out the differences among them. This paper consists one of the part of my dissertation these concerning "Risk analysis for some emergent and re-emergent diseases in poultry for Romania"

Key words: risk analysis, animal health, WAHO, WTO, Codex Alimentarius

Risk analysis is a concept drown-up at the end of the years '60 where Starr proposed, in the revue „Science", a quantitative assessment of risk factors involved in the future planned cosmic missions. The Starr's proposal was considered as a surprise for research workers especially for those applying in the technological world, by the proposed model aiming to realize an analysis of risks involved in cosmic missions whom are to be preformed during that period of time. While Starr singled out modern technology as a natural focus for the application of risk analysis, Lowrence expended to six the number of areas in which it could be used. Since 1969, risk analysis has defined as a proper discipline, having specific terms of references and a particular methodologies for its.

"Risk Analysis Society" subsequently set-up and its own publication "Risk analysis" have constitute structures and development channel for this concept and for some differentiated approaches of risk analysis. So risk analysis is defined as a scientific approach realised with the aim to identify the recognised dangers (risk)

or potential and unknown harmful factors (hazard), to assess those risks, to monitor and managed them and to identify the corrective measures applied with the aim to make these risks "tolerable" or "acceptable" and finally to communicate the options for reducing this risks to decisions makers, do to those persons who have the responsibility to put in place this corrective measures.

While risk analysis was applied in different fields it having an important practical applicability in the most domains of veterinary and food safety services competences, different approaches on risk analysis have been initiated over the world.

Materials and Methods

In order to assess the approaches regarding risk analysis for the fields competence of veterinary and food safety services more evidences and regulations of international veterinary organization and organizations having the incidence in veterinary and food safety sector has been consulted. With that end of view, have been taking over the rules established by World Organization for Animal Health through "Terrestrial Animal Health Code" Part 1, Title 1.3 – "Risk Analysis", the provisions of Codex Alimentarius Commission, the regulations of World Trade Organisation through "Agreement for the Application for the Sanitary and Phytosanitary Measures", as well as the rules stipulated by the "International Plant Protection Convention" as part of Food and Agricultural Organisation. At the same time, several technical documents issued by World Organisation for Animal Health have been also consulted as "Revue scientifique et technique" – "Risk analysis animal health and trade", "Risk assessment for veterinary biologicals", "Handbook on import risk analysis for animal and animal products" vol. 1 and 2, "Risk analysis in aquatic animal health" and "Risk analysis prion diseases in animals". Some elements from the book paper "Modern concepts in veterinary medicine – Risk Analysis" have been also taking over, as well as some definitions and technical aspects concerning risk analysis defined by Veterinary School for Alfort, Paris, France having included, with the aim to define the mean word approaches on risk analysis.

In order to assess the different approaches on risk analysis in relation with its particular field of application we proceeded to a detailed identification of risk analysis structure for the proposed models. The common elements of different approaches on risk analysis and the elements which differentiate the proposed models to perform it have been further pointed out.

Results

Consultation of the nominated paperworks in Material and Methods section pointed out the existence, at the world level, the four models to approach risk analysis:

- European model or World Organisation for Animal Health model promoted by this international veterinary organisation by its two major publications, "Terrestrial Animal Health Code" and "*Aquatic Animal Health Code*",
- American model, promoted by Codex Alimentarius Commission,
- an international model promoted by World Trade Organisation through "Agreement for the Application for the Sanitary and Phytosanitary Measures" and "Agreement on Removal the Technical Barriers",
- model proposed by the Food and Agricultural Organisation through "International Plant Protection Convention",

The first three approaches risk analysis are of interest for the fields of the competence of sanitary veterinary and food safety services.

The European model approaching a risk analysis is based on the model proposed by Carvellio and Merkhofer, in 1993 in the paperwork "Risk assessment methods – approaches for health and environment risks estimations"

The American risk analysis approach model is based on the model imposed by "National Research Centre" of United States National Academy of Sciences.

Risk analysis model proposed by World Organisation for Animal Health consists in the following major steps:

- risk and hazard identification,
- risk appreciation,
- risk management,
- risk communication

The Codex Alimentarius Commission model consists only in three stages:

- risk appreciation,
- risk management,
- risk communication

The World Trade Organisation model consists in four stages:

- risk and danger identification,
- risk assessment,
- risk management,
- risk communication

and Food and Agricultural Organisation consists in four stages:

- risk initiation,
- risk appreciation,
- risk management,
- risk communication

A detailed analysis of the steps for each approach on a risk analysis applied for veterinary and food safety domains that was done has revealed that, generally, these four approaches comprise similar steps for doing risk analysis, but their succession is different in some extent. This aspect has particular importance, if it took into consideration the request of international organisations in the field of

veterinary and food safety, that the structure having the responsibility for doing risk and hazard identification or danger identification or risk initiation and its evaluation must be separated from the structures involved to realised the management and monitor the risk or danger and to lay down the options for corrective measures and at the same time separated from the structures which are dealing to select these options and put them in practice.

The second major result of the realised assessment is referring to the field of competence of the sanitary veterinary and food safety which are reliable for the application of the three approaches refereeing to these domains. In this respect, the World Organisation for Animal Health model is liable to be applied for risk analysis in relation whit the animal health and trade with live animals and animal origin products, in relation with animal nutrition, animal protection and welfare and with some genetic modification and with trade aspects involving animal origin genetic material. We have to point out that the main domain for the application of this risk analysis model is the import of live animals and animal origin products and by-products.

From this point of view, the World Organisation for Animal Health model is the most elaborated model, comprising guidelines referring to the elaboration of risk analysis, veterinary services evaluation as principles and guidelines, zoning regionalization and compartmentalisation, epidemio-surveillance, as well as guidelines for the evaluation of the equivalence of sanitary veterinary measures.

The Codex Alimentarius Commission model is used especially for doing risk analysis in relation with the food safety, particularly for microbiological risks and of some limitative substances or contaminants in food, feed, forage and food staffs.

The World Trade Organisation model is liable to be applied especially for trade exchanges whit live animals and animal products and by-products, feed and feedingstuffs and with the veterinary medical products.

The Food and Agricultural Organisation model is used for plants and plant products used for technical of food.

The third major result of this assessment consists and the fact that, based on the comparative assessment of these three approaches aiming to sanitary veterinary and food safety services competences, we succeeded to promote a complete approach to perform risk analysis, especially referring to the detailed steps to be followed for doing this point out. In this manner in the structure or the first stage of risk analysis - *risk identification* – we propose to be realised the following steps and sub-steps:

a) qualitative risk assessment with:

- risk identification with the sub-steps:
  - risk origin,
  - intermediary zones of risk,
  - risk itinerary,
  - risk destination

- risk assessment with the sub-steps:
  - emission appreciation
  - exposure appreciation
  - dissemination appreciation
  - risk consequences
  - risk assessment
- management or monitor the risk with the sub-steps:
  - risk evaluation
  - elaboration the options and related corrective measures
  - options selection
  - risk quantification of the options
- risk communication with the sub-steps:
  - identification the proposed options
  - aim of taken decisions
  - hierarchy of the options
  - selection of the major options
  - manner of application

b) quantitative risk assessment – suppose the use of mathematical calculus and probability theory to quantify by figures the esteemed risk.

Conclusions

1. Even the major structure of the mean approaches for doing risk analysis is quite similar, the succession of the steps to perform risk analysis is different that implies the precise and differentiated establishment of the operational structures which have responsibility to identify the risk apart from those which have de competence for monitoring and management of risk and of course from those which are dealing to decisions making and implementing these decisions.

2. Each model to approach to risk analysis is liable to be applied for certain domains of sanitary veterinary and food safety services competences.

3. Through this paper we are going to propose a detailed and complete structure for risk analysis that could be applied for most of the fields of the sanitary veterinary and food safety services competences.

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