codex alimentarius commission

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

WORLD HEALTH ORGANIZATION

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Agenda Item 8 **CX/FBT 06/6/8**

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JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX AD HOC INTERGOVERNMENTAL TASK FORCE ON FOODS DERIVED FROM BIOTECHNOLOGY

Sixth Session

Chiba, Japan, 27 November – 1 December 2006

DISCUSSION PAPER ON SAFETY ASSESSMENT OF FOODS DERIVED FROM ANIMALS EXPOSED TO PROTECTION AGAINST DISEASES THROUGH GENE THERAPY OR RECOMBINANT – DNA VACCINES

(Submitted by Kenya)

Background[1]

1. At the Fifth Session of the Task Force, Kenya proposed that the Task Force should consider, as possible future work, safety assessment of foods derived from animals exposed to protection against diseases through gene therapy or recombinant - DNA vaccines.

2. The Task Force noted that the World Organisation for Animal Health (OIE) and other international organisations had ongoing work on the application of these techniques in food animals and that duplication of work with these organisations should be avoided. The Task Force further noted that its terms of reference did not include issues relating to animals that were not modified as such but were fed with genetically modified feeds or treated with recombinant - DNA vaccines.

3. The Task Force however recognized that there might be a potential food safety issue associated with foods derived from animals treated with recombinant - DNA vaccines or gene therapy and that there was a merit in following up the issue in the light of the work being undertaken by other organisations, namely OIE.

4. The Task Force therefore invited Kenya to submit a discussion paper to the 6th Session of the Task Force to further elaborating the matter.

5. The Paper submitted by Kenya is in the Annex to this document.

[1] ALINORM 06/29/34, paras 63-66

ANNEX

PROJECT DOCUMENT

Proposal for Future Work: Guidelines for Conduct of Safety Assessment of Foods Derived from Animals Exposed to Recombinant DNA Vaccines.

Prepared by Kenya

1. Purposes and scope of the proposed work

To develop guidelines for safety assessment of foods derived from animals exposed to recombinant DNA (r-DNA) vaccines. The guideline would take as a model the codex guidelines for the conduct of food safety assessment of foods derived from r-DNA plants (CAC/GL 45-2003) and the draft proposed guidelines for r-DNA animals taking into account the differences between foods derived from r-DNA animals and foods derived from animals exposed to r-DNA vaccines:

- Foods derived from recombinant DNA animals have the introduced gene potentially in all the cells of the animal body including the germline cells, meaning food from such animals is inherently recombinant whereas;
- Foods derived from animals exposed to r-DNA vaccines may have a few select target cells or tissues containing the introduced DNA, which may or may not even be integrated in the cells. In this case, the part of the food animal in which r-DNA vaccines were introduced during vaccination may contain traits, and /or DNA products introduced by modern biotechnology, which, when consumed may have profound effects on human (public) health.

2. Relevance and timeliness

Recombinant DNA vaccines are under development in several countries. For instance, Kenya is undertaking clinical trials to test efficacy of r-DNA vaccines against diseases such as rinderpest and rift valley fever, a zoonotic disease. In future, use of r-DNA vaccines is likely to become common in animal health programmes, and products derived from such treated animals are also likely to be placed on the market. Although the quantities of the r-DNA vaccines injected into the animal may be considered negligible due to the miniscule quantities used in comparison to the total body mass of the animal, evidence derived from experience with prions indicates that small quantities of biological agents can lead to great public health concerns. Justifiably, this creates the need to provide an assurance to consumers that foods derived from animals exposed to r-DNA vaccines are safe and sound for human consumption. The guidelines will therefore provide a framework for assessing such foods.

3. The main aspects to be covered

The guideline for conduct of safety assessment of foods derived from animals exposed to r-DNA vaccines will cover potential allergenicity to the expressed protein, potential toxicity, transfer of plasmid mediated antibiotic resistance from the selective marker genes, and transfer of risks associated with transposable genes as well as gene regulatory elements (e.g. promoters, terminators and enhancers) on consumption of the food animal products. The Guideline for the Conduct of Food safety Assessment of Foods Derived from Recombinant-DNA Plants (CAC/GL 45-2003), Guideline for the Conduct of Food safety Assessment of Foods Produced using Recombinant-DNA Microorganisms (CAC/GL 46-2003) and Proposed Draft Guideline for the Conduct of Food safety Assessment of Foods Derived from Recombinant-DNA Animals will be used as models.

4. Assessment against the criteria for establishment of work priorities

The proposal is consistent with the following criteria:

i) **General criteria**

Consumer protection from the point of view of health, food safety, ensuring fair trade practices in the food trade and taking into account the identified needs of developing countries:

This guideline will contribute to the enhancement of consumer protection by providing guidance to perform safety assessment of food derived from animals exposed to r-DNA vaccines, considering variations in home preparation practices, and processing of animal foods among global communities.

ii) **Criteria applicable to general subjects**

a. *Diversification of national legislations and apparent resultant or potential impediments to international trade:*
This work will provide scientific guidance which countries will use to develop their own safety methodology, safety standards, and regulatory framework, and which, when applied internationally may assist in providing a harmonized approach.

b. *Scope of work and establishment of priorities between the various sections of this work:*
It will be consistent with paragraph 1.

c. *Work already undertaken by other organization in this field and/or suggested by the relevant international intergovernmental body (ies):*
There is no other international organization that has undertaken work on foods derived from animals exposed to recombinant-DNA vaccines. However, the guidelines will complement the development of recommendations and guidelines for use of DNA vaccines in food animals by OIE[1].

5. Relevance to Codex strategic objectives

The proposal meets the following general objectives:

Objective 1: Promoting sound regulatory framework

Objective 2: Promoting widest and consistent scientific principles and risk analysis.

Objective 3: Promoting linkages between Codex and other multilateral regulatory instruments and conventions.

Objective 4: Enhancing capacity to respond effectively and expeditiously to new issues, concerns and developments in the food sector.

Objective 6: Promoting maximum application of Codex standards.

6. Information on the relationship between the proposal and other existing documents

The proposed document will not duplicate existing Codex documents and, in particular will be consistent with the Working Principles for Risk Analysis for Application in the framework of the Codex Alimentarius and the Principles of the Risk Analysis of Foods Derived from Modern Biotechnology (CAC/GL 44-2003). It will complement the Guideline for the Conduct of Food safety Assessment of Foods derived from Recombinant-DNA Plants

[1] 73rd General Session of International Committee World Organization for Animal Health (OIE), Resolution XXVIII, May 2005.

(CAC/GL 45-2003), and the Guideline for the Conduct of Food Safety Assessment of Foods Produced Using Recombinant-DNA Microorganisms (CAC/GL 46-2003) and the Proposed Draft Guideline for the Conducts of Food Safety Assessment of Foods Derived from Recombinant DNA Animals.

7. Identification of any requirement for and availability of expert scientific advice.

The following areas may need to be investigated to provide information in relation to potential risks to human health from consumption of the foods derived from animals exposed to r-DNA vaccines:

i) Allergenicity or toxicity of the expressed proteins
ii) Safety and /or transfer of marker genes used in the DNA plasmid or recombinant organism to indicator, zoonotic and pathogenic bacteria
iii) Safety of microbial host used in the production of vaccine
iv) Safety and species restriction of promoters and transposable genes used in the expression of the gene of interest
v) Species restriction of the origin of replication of the plasmid DNA
vi) Safety of the gene regulatory elements in the vector.
vii) Stability of r-DNA in the body tissues and on food processing
viii) Issues of potential autoimmunity brought about by differences in DNA methylation patterns of the r-DNA and human DNA

There may also be need to consult with the Codex Committee on Residues of Veterinary Drugs in Foods, and additional scientific advice will be considered during the discussion of this document and the elaboration process of the draft guidelines.

8. Identification of any need for technical input to the standard from external bodies so that this can be planned for

Coordination with OIE will be required, as they will also be developing recommendations and guidelines for use of DNA vaccines in food animals.

Identification of further technical input will be considered during the discussion of this document and the elaboration process of the guidelines. Reference may also be made to the document below[2].

9. The proposed timeline for completion of the new work, including the start date, the proposed date for adoption at step 5, and the proposed date for adoption by the commission; the timeframe for developing a standard should not exceed five years

Considering that:

i) No expert consultation or evaluation has been done on the safety of foods derived from animals exposed to r-DNA vaccines, it is proposed that necessary expert consultations be started and completed within the remaining 3 year-lifespan of the task force to provide scientific advice for use in the development of the proposed guideline, and since
ii) There may be no sufficient time to complete the elaboration of the guideline within the lifespan of the task force, it be prioritized as a future project in the next task force.

[2] Jacob Glenting and Stephen Wessels (2005). Ensuring safety of DNA vaccines, A Review, **Microbial Cell Factories. 4:26** (http://www.microbialcellfactories.com/content/4/1/26)