

codex alimentarius commission



FOOD AND AGRICULTURE
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JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON FOOD HYGIENE

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DRAFT TERMS OF REFERENCE FOR THE FAO/WHO EXPERT CONSULTATION ON THE USES OF ACTIVE CHLORINE¹

Prepared by Canada with assistance of Austria, Denmark, EC, France, Ireland, Japan, Republic of Korea, the Netherlands, the United States of America and IDF

INTRODUCTION

At the 36th Session, the Codex Committee on Food Hygiene (CCFH) noted the request of the 36th Session of the Codex Committee on Food Additives and Contaminants (CCFAC) (Rotterdam, 22-26 March 2004) to FAO/WHO to convene an Expert Consultation to conduct a comprehensive risk assessment on the uses of active chlorine, taking into account benefits and risks and that the CCFAC agreed on the need to clearly define the scope of the consultation. It further noted that CCFAC would prepare clear terms of reference for the aspect relevant to its work and that it requested relevant Committees, including the Committee on Food Hygiene to consider risk/benefit issues relevant to uses of active chlorine within their respective purviews and to elaborate terms of reference for the expert consultation within their mandate and pose questions so that the Expert Consultation could be comprehensive. The CCFH agreed to consider this matter on Agenda Item 14 “Other Business and Future Work” (see para. 158).

The Committee agreed that a drafting group lead by Canada with assistance of Austria, Denmark, EC, France, Ireland, Japan, Republic of Korea, the Netherlands, the United States of America and IDF would prepare draft terms of reference for the FAO/WHO Expert Consultation on the uses of active chlorine which would include risk/benefit issues and prepare questions within its terms of reference of the Committee. The Discussion Paper was circulated to members of the drafting group electronically.

PURPOSE

Active chlorine has been used extensively and effectively to control detrimental microorganisms associated with food. Any consideration of risks associated with this group of compounds must consider the likely consequences of its availability as a cost effective means of reducing both foodborne disease and food spoilage. This document is intended to articulate the microbiological risks and benefits that should be considered by the proposed Expert Consultation to account for the risks that could be

¹ Aspects relevant to CCFH.

associated with this group of compounds becoming unavailable. The Codex Committee on Food Additives and Contaminants (CCFAC) is developing a companion document on the toxicological issue related to the use of active chlorine with foods.

BACKGROUND

Sodium hypochlorite (chlorine bleach) and similar chlorine derivatives have been used to reduce microbes in water supplies for many years. As a general principle, the most effective use of active chlorine treatment has been in water, and the greatest benefit with regard to food processing is seen as use in processing waters to prevent cross contamination in handling facilities. Hypochlorous acid is the active ingredient of chlorine solutions. This type of treatment requires relatively neutral pH for maximum efficacy. Chlorine readily combines with chemicals bound in water, microorganisms, plant material, soil, and other organic matter. The organic load of treated material removes chlorine from solution, effectively compromising their antimicrobial activity. Consequently, applications in which chlorine may be bound with organic matter require monitoring of the concentrations of available chlorine.

Direct use of chlorine compounds on food surfaces is a more recent antimicrobial intervention. The use of active chlorine forms such as acidified sodium chlorite and chlorine dioxide for microbial treatment of foods or water used in food processing is relatively recent. In particular, active chlorine in the form of sodium chlorite, acidified to pH 2.3 to 2.9 with several common acids, has been used for several types of treatment including direct application to meat and poultry surfaces, as well as to processing water, and has been the subject of scientific investigation for several years.

QUESTIONS FOR CONSIDERATION

CCFH recommends that the terms of reference for the expert consultation to be conducted by FAO/WHO include consideration of the microbiological benefits from the treatment of food, food processing water, or food contact surfaces with different forms of active chlorine and the potential risks that might arise if these compounds were no longer available. The primary benefits include elimination of potential contamination with pathogenic and non-pathogenic microorganisms from the direct treatment of foods with active chlorine, and the elimination of contamination or cross contamination from food processing water and food contact surfaces. Accordingly, the microbiological risks of concern, if these agents are no longer available, are potential increases in foodborne disease due to increased contamination with pathogenic microorganisms and decreases in food quality and availability due to increases in non-pathogenic spoilage microorganisms. The risk assessment to be conducted by Expert Consultation should focus on specific microbial hazards (e.g., specific pathogens) and specific spoilage issues associated with particular foods or food processing environments that are currently controlled by the use of active chlorine. Risks considered should include whether the treatment itself or elimination of such treatment could result in increased exposure to microbial hazards under some conditions and decreased availability of foods.

The risks and factors that should be considered by the expert consultation include:

- the risk of increased exposure to microbial hazards or increased microbial loads associated with different types of food or food processing surfaces
- the availability of alternative technologies or treatments that could be used as an alternative to active chlorine in order to control microbiological contamination
- the relative efficacy of alternative technologies or treatments both in terms of effectiveness and relative cost of application
- the risks associated with the application of alternative technologies or treatments

- potential “unintended consequences” arising from the reduction or substitution in the use of active chlorine as an antimicrobial treatment (e.g., the generation of mutagenic compounds due to the application of heat treatments, the emergence of antimicrobial resistance in response to alternative antimicrobials).

The consultation should focus on consideration of data on which pathogen/food spoilage microorganism-food commodity combinations are currently controlled effectively by active chlorine treatments. If feasible, the consultation should consider the effectiveness of active chlorine compounds in a quantitative manner to determine if reductions in the levels of active chlorine compounds could be realized without increasing substantially the risk of foodborne disease or food spoilage.

Elements Requiring Elaboration

In evaluating the antimicrobial effectiveness of active chlorine (or their alternatives), the expert consultation should be cognizant of and take into account:

- the differential activity of active chlorine in different types of food due to factors such as time and temperature of application, pH of the food matrix, and level of organic material,
- the differential activity of active chlorine as a result of physical state of the medium (e.g., liquid vs. solid, surface vs. interior)
- the different susceptibility of microorganisms on food contact surfaces versus those present in biofilms

Utilization of Existing Information

Wherever feasible, the expert consultation should identify and make use of existing risk assessments or risk evaluations that have been performed by national governments or recognized scientific organizations.

TIME FRAME

Since the results of the expert consultation are needed to determine if any further consideration of active chlorine should take place within CCFAC, the final report of the risk assessment should be completed within 48 months.