codex alimentarius commission

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

WORLD HEALTH ORGANIZATION

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Agenda Item 14 (d)

CX/FAC 06/38/31-Add. 2
April 2006
(English only)

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON FOOD ADDITIVES AND CONTAMINANTS

Thirty-eighth Session

The Hague, the Netherlands, 24 – 28 April 2006

PROPOSED DRAFT CODE OF PRACTICE FOR THE REDUCTION OF CHLOROPROPANOLS DURING THE PRODUCTION OF ACID HYDROLYZED VEGETABLE PROTEIN (HVPS) AND PRODUCTS THAT CONTAIN ACID HVPS

COMMENTS at Step 3

The following comments have been received from: Japan

Japan:

Japan greatly appreciates the efforts of the United Kingdom in preparing this document. As a member of the drafting group, the Japanese Government submitted comments and information. Since then, we have been provided some additional information regarding effects of various production conditions on the quality and productivity of acid-HVPs from The Japan Hydrolyzed Protein Association. We would like to forward the information as follows:

Para 12

The last sentence should be deleted unless it is supported by scientific evidence.

Para 15

Acid-HVPs may constitute as much as 80% (wet weight basis) of some types of soy-sauce. Soy sauce has a variety of uses as a seasoning. It is commonly used as a marinade or like a kind of dressing by itself on various foods. Therefore, the flavour of soy sauce is a critical characteristic, which is greatly influenced by the quality and composition of acid-HVPs.

A study was conducted in a laboratory to see effects of hydrolysis/alkaline treatment conditions on the productivity and flavour of resulting acid-HVPs. See Scheme 1 below for the condition of the study.

Scheme 1. Process of Acid-HVP Production in Laboratory

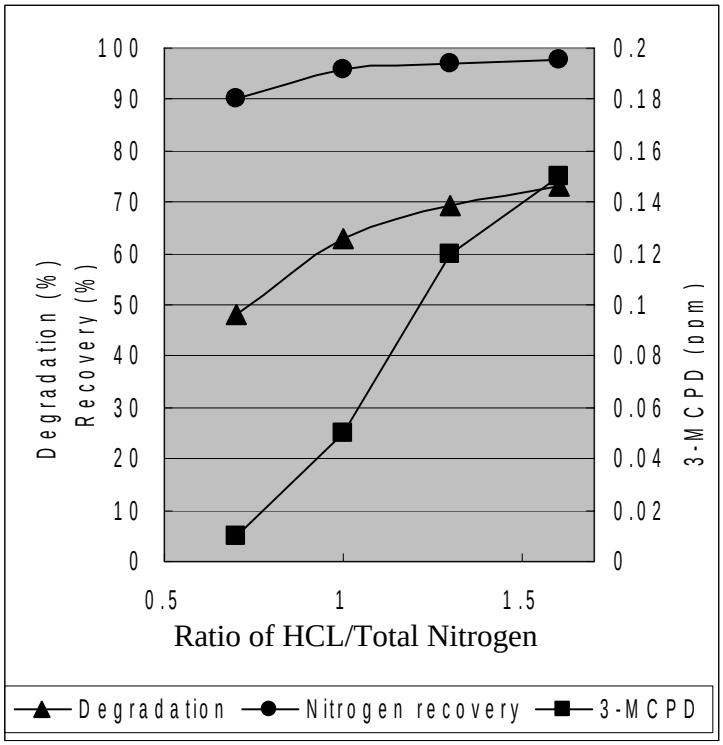
Acid hydrolysis of defatted soybean meals with hydrochloric acid (with HCl/total N ratio from 0.7 to 1.6)
|
Treatment with sodium hydroxide at pH 8.5 or 9.5
Neutralization with hydrochloric acid to pH 5.1
|
Filtration
|
Concentration to about 3.7 g-total nitrogen/100 ml
|
Cooling to let sodium chloride precipitate
|
Filtration

Effect of Acid Hydrolysis

After acid hydrolysis, total nitrogen (a) and formol nitrogen (b) in filtrate, and total nitrogen in filtration cake (c) were determined. Protein degradation rate (ratio of free amino acid nitrogen in filtrate to total nitrogen in filtrate) and nitrogen recovery rate (ratio of total nitrogen in filtrate to total nitrogen in defatted soybean) were calculated as (b)/(a) and (a)/((a)+(c)) respectively. As shown in Figure 1, both the degradation rate and nitrogen recovery rate decrease as the ratio of HCl to total nitrogen in soybeans decreases (commonly used ratio: 1.6). They decrease sharply when the HCl/total nitrogen ratio was lowered from 1.0 to 0.7 reducing the productivity of acid HVP, resulting in increased production cost.

Moreover, an organoleptic test carried out on sample acid HVPs produced with different HCl/total nitrogen ratios and the same treatments thereafter (see Scheme 1) showed that sample acid HVPs produced through acid hydrolysis with HCl/total nitrogen ratio of 1.0 and 0.7 had significantly different flavour and appearance from those produced with the ratio of 1.6 and 1.3. Although the concentration of 3-MCPD in these samples after the first filtration decreases significantly as the ratio of HCl to total nitrogen decreases, the results above indicate that reducing the ratio to or lower than 1.0 will have negative effects on the organoleptic characteristics and productivity of acid-HVPs.

Figure 1. Effect of Ratio of HCl/Total Nitrogen in Acid Hydrolysis on Degradation of Protein and Nitrogen Recovery



Alkaline Treatment

To simulate commercially available acid-HVPs, after alikaline treatment, the resulting solutions were neutralized by hydrochloric acid, then concentrated *in vacuo* to the total nitrogen concentrations of about 3.7 g/100 ml and precipitating sodium chloride were removed by filtration to the concentration of 21 g/100 ml . Concentrations of total nitrogen and sodium chloride in the neutralized solutions are shown in Table 1 below.

Sample from alkaline treatment at pH 8.5 were similar to that from pH 9.5 in most of organoleptic tests, although pH 9.5 treated sample contained less than 0.01 ppm (wet basis) of 3-MCPD. However, when the neutralized solution of pH 9.5 treatment is concentrated to adjust the total nitrogen concentration to about 3.7 g/100 ml, the excess sodium chloride, due to the addition of larger amount of both sodium hydroxide and hydrochloric acid than pH 8.5 treatment, precipitates. This requires additional steps, and possibly equipment, to remove extra salt, leading to increased production cost.

Table 1. Total Nitrogen and Sodium Chloride after Each Step of the Production Process in Laboratory

Alkaline treatment at:	pH 8.5	pH 9.5	pH 8.5	pH 9.5
Step	Total nitrogen (g/100 ml)		Sodium chloride (g/100 ml)	
After first filtration	2.21	1.95	16.4	17.6
After concentration	ca. 3.7	ca. 3.7	27.5 (theoretical)	33.4 (theoretical)
After cooling and filtration	3.97	3.66	21.1	21.2

Para18

The first sentence should be amended as follows:

Soy sauces that are produced solely by fermentation ~~do not contain~~ contained non-quantifiable or, in rare cases, extremely low concentration of 3-MCPD.

Para19

Japan is of the opinion that the there is a need to describe why the level of 0.02 mg/kg is achievable for information because the statement does not agree with our surveillance results.