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Agenda Item 4(a)

CX/ASIA 08/16/5  
September 2008

## JOINT FAO/WHO FOOD STANDARDS PROGRAMME FAO/WHO COORDINATING COMMITTEE FOR ASIA

*Sixteenth Session*

*Denpasar, Indonesia, 17-21 November 2008*

### PROPOSED DRAFT STANDARD FOR FERMENTED SOYBEAN PASTE (N02-2004) - SECTION 3.2 (QUALITY FACTORS)

(at Step 3 of the Elaboration Procedure)

#### Report of the Electronic Working Group on Section 3.2 (quality factors) of the Proposed Draft Standard for Fermented Soybean Paste

(Prepared by Republic of Korea with the assistance of China, Indonesia, India, Japan, Malaysia,  
Singapore and Thailand)

Governments and international organizations wishing to submit comments at Step 3 on Section 3.2 (Quality Factors) of the Proposed Draft Standard for Fermented Soybean Paste, as presented in Annex to this document, are invited to do so **no later than 15 October 2008** to: Dr Sunarya, Deputy Director-General, the National Standardization Agency of Indonesia (Facsimile: +62 21 574045 or E-mail: [sps-2@bsn.or.id](mailto:sps-2@bsn.or.id) (*preferably*)), with a copy to the Secretary, Codex Alimentarius Commission, Joint FAO/WHO Food Standards Programme, Viale delle Terme di Caracalla, 00153 Rome, Italy (Facsimile: + 39.06.5705.4593 or E-mail: [codex@fao.org](mailto:codex@fao.org) (*preferably*)).

#### BACKGROUND

1. The 15<sup>th</sup> Session of the Committee agreed to hold the Proposed Draft Standard for Fermented Soybean Paste at Step 4, with the exception of Section 3.2 (Quality Factors) and to establish an electronic working group led by the Republic of Korea in order to further consider the provisions under Section 3.2.<sup>1</sup>

#### REQUEST FOR COMMENTS

2. The Report of the Electronic Working, containing the revised draft Section 3.2, is attached as Annex to this document. Governments and international organizations wishing to provide comments on the revised draft Section 3.2 should do so in writing, *preferably by e-mail*, to the addresses above by **15 October 2008**.

<sup>1</sup> ALINORM 07/30/15, paras 96-97

## ANNEX

## Report of the Electronic Working Group on Section 3.2 (Quality Factors) of the Proposed Draft Standard for Fermented Soybean Paste

### BACKGROUND

1. The 15th session of CCASIA decided to establish an electric working group, which should further consider the provisions under Section 3.2 (Quality Factors) of the proposed draft Standard for Fermented Soybean Paste and agreed to let the Republic of Korea serve as the chair of the group.

### PROCEEDING OF THE WORKING GROUP

2. The Republic of Korea has encouraged all the CCASIA members as well as the members of the e-working group involved to provide the chair country with their comments and/or opinions, if any, on Section 3.2 (Quality Factors), while Korea has undertaken in-depth analyses of samples of fermented soybean paste products from several different countries in order to make a more concrete revised proposal on "Quality Factors." The Republic of Korea has gathered different Fermented Soybean Paste products mainly from the countries which expressed their opinions during the last session of CCASIA about the quality factors of the proposed draft Standard for Fermented Soybean Paste. Efforts have been made to collect as many kinds of the products as possible and, at last, a total of 49 kinds have been gathered and analyzed.

3. Then, Korea as the chair of the working group sent off, at the end of May 2008, a kick-off message for the operation of the group and requested CCASIA members to present their opinions and/or comments (if any) on the Quality Factors section no later than July 12, 2008, along with Korea's revised proposal on the section [Appendix I to this report]; but, no other countries have provided Korea with their opinions in writing than Japan. Malaysia did reply to Korea's request, but it said in its letter dated July 29, 2008 that it has no further comments on the section in question.

4. Japan provided the chair country with very useful comments [Appendix II to this report] and relevant data [Appendix I to this report], which are reflected in this report of the e-working group.

5. Mainly based on the results of the analyses undertaken by the Republic of Korea and Japan, the working group is pleased to report to the 16th session of CCASIA that the following conclusions have been reached.

### DETAILED DISCUSSION ON THE QUALITY FACTORS AND CONCLUSIONS

#### TOTAL NITROGEN CONTENT

6. The analyses undertaken by the Republic of Korea determined the total nitrogen content in Fermented Soybean Paste products, and it was found that the content was  $2.03 \pm 0.38\%$  on the average and the minimum value was 1.32% (See Table 1 of Appendix I to this report). As you know well, the proposed draft Standard for Fermented Soybean Paste initially suggested "Total Nitrogen: no less than 1.2% (w/w)," and it does not seem unreasonable to still maintain the initial suggestion.

7. On the other hand, Japan independently collected and analyzed 105 samples. The total nitrogen content in the Fermented Soybean Paste products determined by Japan was  $1.76 \pm 0.53\%$  on the average (See Table 1 of Appendix I to this report), which is lower than determined by Korea. The chair country has combined the data suggested by both of the two countries. The table below shows the combination of the results of all the analyses conducted by Korea and Japan.

**Table 1** Total nitrogen content in fermented soybean paste products collected and analyzed by Korea and Japan

| (unit: %)     |         |      |                    |      |      |                     |
|---------------|---------|------|--------------------|------|------|---------------------|
|               | Samples | Mean | Standard deviation | MAX  | MIN  | Remarks             |
| Only soybean  | n=27    | 2.56 | 0.47               | 3.53 | 1.60 | Pr> t <br><0.001*** |
| Soybean+grain | n=127   | 1.69 | 0.36               | 2.68 | 0.61 |                     |
| All types     | n=154   | 1.84 | 0.50               | 3.53 | 0.61 |                     |

8. You can recall that, in the last session of CCASIA, the Republic of Korea suggested two different sets of quality factors, one of which was applicable to the products manufactured by additionally using grains as an optional ingredient or to those using only soybean as the ingredient. Meanwhile, it was also found that there was a significant difference in the content of total nitrogen between two groups of Fermented Soybean Paste products: one (the number of samples = 127) of which was manufactured using grains (wheat, barley and/or rice) as an optional ingredient and the other (the number of samples = 27) using soybean as the only ingredient. In the latter group, the mean of total nitrogen is 2.56% and the minimum value 1.60%. In contrast, in the former group or the products with grain, the mean of total nitrogen is 1.69% and the minimum value 0.61%.

9. Concerning the total nitrogen, consumers expect that even the Fermented Soybean Paste products, which are added with grains, contain a certain amount of soybean. However, we have no regulation on the fixed quantity of soybean contained in such products, because the total nitrogen value represents the soybean content. Most of the total nitrogen contents for the Fermented Soybean Paste products made with soybean and grain, listed in the appendixes to this report, are more than 0.8%, while the data submitted by Japan show there are a few unconformable products, in which the total nitrogen content is slightly lower than 0.8%. So, in order to include all the products traded within commodity groups rather than highly specific standards, it is advisable that the total nitrogen content in the products with grains should be no less than 0.6%.

10. Consequently, the electric working group concludes that the total nitrogen of no less than 1.6% is applicable to those products using only soybean as the ingredient while no less than 0.6% applicable to those additionally using grains as an optional ingredient.

#### AMINO NITROGEN CONTENT

11. The analyses undertaken by the Republic of Korea determined the amino nitrogen content in Fermented Soybean Paste products, and it was found that the content was  $0.531 \pm 0.258\%$  on the average and the minimum value was 0.154% (See Table 2 of Appendix I to this report), which implies that there was a very big deviation depending upon the kind of the products. It seems that the deviation was chiefly due to proper characteristics of the products whose manufacturing processes are different from each other. As you know well, the proposed draft Standard for Fermented Soybean Paste initially suggested "Amino nitrogen: no less than 0.25% (w/w)," which value cannot tolerate some of the Fermented Soybean Paste products.

12. On the other hand, the amino nitrogen content in the Fermented Soybean Paste products determined by Japan was  $0.426 \pm 0.182\%$  on the average and the minimum value was 0.098% (See Table 2 of Appendix I to this report). The table below shows the combination of the results of all the analyses conducted by Korea and Japan.

**Table 2** Amino nitrogen content in Fermented Soybean Paste products collected and analyzed by Korea and Japan

(unit: %)

|               | Samples | Mean  | Standard deviation | MAX   | MIN   | Remarks   |
|---------------|---------|-------|--------------------|-------|-------|-----------|
| Only soybean  | n=27    | 0.773 | 0.210              | 1.220 | 0.385 | Pr> t     |
| Soybean+grain | n=123   | 0.392 | 0.143              | 1.015 | 0.098 | <0.001*** |
| All types     | n=150   | 0.461 | 0.215              | 1.220 | 0.098 |           |

13. As in the case of total nitrogen, there was also a significant difference in the content of amino nitrogen between two groups of Fermented Soybean Paste products, one (the number of samples = 127) of which was manufactured using grains (wheat or rice) as an optional ingredient and the other (the number of samples = 27) using only soybean as the ingredient. In the latter group, as you can see in the above Table 2, the mean of amino nitrogen was 0.773% and the minimum value 0.385%. In contrast, in the former group, the mean of amino nitrogen was 0.392% and the minimum value 0.098%.

14. By the way, Fermented Soybean Paste products, which are in contrast to non-Fermented Soybean Paste products, need be fermented appropriately. In the proposed draft standard concerned, the only quality factor indicating the degree of fermentation of the products, no matter how long they are fermented, is the amino nitrogen content. It implies that Fermented Soybean Paste products are expected to contain a certain amount of amino nitrogen. So, considering the results presented by the two countries, it is very proper that the minimum amino nitrogen content in the products made with soybean only should be 0.3%, which applies to any kind of Fermented Soybean Paste products. By contrast, in connection with the products made with soybean and grain, there is a difference in the minimum amino nitrogen content between the products analyzed by Korea (0.15%) and those by Japan (0.10%).

15. Assuming that the minimum amino nitrogen content in the products with soybean only is 0.3%, as is suggested by Japan, and that the amino nitrogen content is proportionate to the total nitrogen content, the minimum amino nitrogen content in the products with soybean and grain should be 0.12% (more accurately, 0.1125%). This value (0.12%) is corresponding to all the data suggested by Japan, except only one sample in which the minimum amino nitrogen content is 0.098% (See Appendix II to this report). Based on such a rationale, it is very safe and reasonable to determine, in this report, that the minimum amino nitrogen content in the products made with soybean only is 0.3% and that the content in those with soybean and grain is 0.12%. Here, for your information, Japan suggests the minimum amino nitrogen should be 0.10%.

### Moisture content

16. The analyses undertaken by the Republic of Korea determined the moisture content in Fermented Soybean Paste products, and it was found that the content was 49.63±4.75% on the average and the maximum value was 56.98% (See Table 3 of Appendix I to this report). Initially, the proposed draft Standard for Fermented Soybean Paste suggested "Moisture: no more than 60.0% (w/w)."

**Table 3** Moisture content in Fermented Soybean Paste products collected and analyzed by Korea

(unit: %)

|               | Samples | Mean  | Standard deviation | MAX   | MIN   | Remarks          |
|---------------|---------|-------|--------------------|-------|-------|------------------|
| Only soybean  | 12      | 50.77 | 5.96               | 56.64 | 35.03 | Pr>Itl<br>0.4274 |
| Soybean+grain | 37      | 49.26 | 4.32               | 56.98 | 39.30 |                  |
| All types     | 49      | 49.63 | 4.75               | 56.98 | 35.05 |                  |

17. It was found that there was no significant difference in the content of moisture between two groups of Fermented Soybean Paste products, one of which was manufactured using grains as an optional ingredient and the other using only soybean as the ingredient. It implies that there need not be two different criteria for moisture content, one of which is applicable to the products manufactured additionally using grains as an optional ingredient or to those using only soybean as the ingredient. Therefore, the electric working group reasonably and safely concludes that the moisture of less than 60% is applicable to the standard concerned.

### RECOMMENDATIONS TO THE 16<sup>th</sup> SESSION OF CCASIA

18. The revised Section 3.2 of the proposed draft standard as presented below should be distributed to the Codex members and observers including CCASIA members for consideration at the 16th session of CCASIA and be advanced through the step procedure of Codex.

19. It was recognized that the above-mentioned conclusions are the findings made primarily by the Republic of Korea and Japan, which understand that the other CCASIA members and observers may suggest their further comments and/or opinions before or during the coming session of CCASIA and wish them to do so, but preferably before the session so that other CCASIA members and observers as well as the chair of the working group may ponder carefully and deeply on them.

### Revised draft Section 3.2 (Quality Factors)

#### 3.2 QUALITY FACTORS

|                      | <u>Fermented soybean paste manufactured with soybean only</u> | <u>Fermented soybean paste manufactured with soybean and grains</u> |
|----------------------|---|---|
| Total nitrogen (w/w) | No less than <del>1.21</del> <u>1.6</u> %                     | <u>No less than 0.6</u> %   |
| Amino nitrogen (w/w) | No less than <del>0.25</del> <u>0.3</u> %                     | <u>No less than 0.12</u> %  |
| Moisture (w/w)       | Not more than 60 %  |   |

The product shall have the flavour, odour, colour and texture characteristic of the product.

## Appendix I

## Combination of the results of analyses conducted by Korea and Japan

**Table 1** Content of total nitrogen in different fermented soybean paste test samples (analysis method: AOAC 984.13)

(Unit: %)

| Tested in | Sample  | Country of manufacturer | Mean±SD   | Remarks   | Ingredients             |                         |
|-----------|---------|-------------------------|-----------|-----------|-------------------------|-------------------------|
| Korea     | 1       | A                       | 2.59±0.09 | n=12      | only soybean            |                         |
|           | 2       |                         | 2.31±0.12 | n=3       | soybean + grain (wheat) |                         |
|           | 3       |                         | 2.02±0.03 | n=3       | soybean + grain (wheat) |                         |
|           | 4       |                         | 2.07±0.00 | n=3       | only soybean            |                         |
|           | 5       |                         | 2.13±0.04 | n=3       | soybean + grain (wheat) |                         |
|           | 6       |                         | 2.51±0.03 | n=3       | only soybean            |                         |
|           | 7       |                         | 2.05±0.04 | n=3       | soybean + grain (wheat) |                         |
|           | 8       |                         | 2.27±0.08 | n=3       | only soybean            |                         |
|           | 9       |                         | 2.58±0.06 | n=3       | only soybean            |                         |
|           | 10      |                         | 2.42±0.11 | n=3       | only soybean            |                         |
|           | 11      |                         | 2.40±0.03 | n=3       | only soybean            |                         |
|           | 12      |                         | 1.97±0.03 | n=3       | only soybean            |                         |
|           | 13      |                         | 2.36±0.02 | n=3       | only soybean            |                         |
|           | 14      |                         | 2.78±0.01 | n=3       | only soybean            |                         |
|           | 15      | 1.77±0.04               | B         | 1.77±0.04 | n=12                    | soybean + grain (rice)  |
|           | 16      | 1.83±0.01               |           | n=3       | soybean + grain (rice)  |                         |
|           | 17      | 2.14±0.01               |           | n=3       | soybean + grain (rice)  |                         |
|           | 18      | 2.21±0.00               |           | n=3       | soybean + grain (rice)  |                         |
|           | 19      | 1.91±0.02               |           | n=3       | soybean + grain (rice)  |                         |
|           | 20      | 1.86±0.09               |           | n=3       | soybean + grain (rice)  |                         |
|           | 21      | 1.93±0.02               |           | n=3       | soybean + grain (rice)  |                         |
|           | 22      | 1.41±0.03               |           | n=3       | soybean + grain (rice)  |                         |
|           | 23      | 1.90±0.04               |           | n=3       | soybean + grain (rice)  |                         |
|           | 24      | 1.94±0.01               |           | n=3       | soybean + grain (rice)  |                         |
|           | 25      | 1.99±0.01               |           | n=3       | soybean + grain (rice)  |                         |
|           | 26      | 1.80±0.01               |           | n=3       | soybean + grain (rice)  |                         |
|           | 27      | 1.83±0.01               |           | n=3       | soybean + grain (rice)  |                         |
|           | 28      | 1.99±0.01               |           | n=3       | soybean + grain (rice)  |                         |
|           | 29      | 1.52±0.01               |           | n=3       | soybean + grain (rice)  |                         |
|           | 30      | 1.32±0.00               |           | n=3       | soybean + grain (rice)  |                         |
|           | 31      | 1.86±0.01               |           | n=3       | soybean + grain (rice)  |                         |
|           | 32      | 1.78±0.03               |           | n=3       | soybean + grain (rice)  |                         |
|           | 33      | 1.61±0.01               |           | n=3       | soybean + grain (rice)  |                         |
|           | 34      | 1.66±0.01               |           | n=3       | soybean + grain (rice)  |                         |
|           | 35      | 1.67±0.03               |           | n=3       | soybean + grain (rice)  |                         |
|           | 36      | 1.98±0.04               | C         | 1.98±0.04 | n=12                    | soybean + grain (wheat) |
|           | 37      | 2.00±0.05               |           | n=3       | soybean + grain (wheat) |                         |
|           | 38      | 1.88±0.01               |           | n=3       | soybean + grain (wheat) |                         |
|           | 39      | 1.85±0.02               |           | n=3       | soybean + grain (wheat) |                         |
|           | 40      | 1.88±0.03               |           | n=3       | soybean + grain (wheat) |                         |
|           | 41      | 2.37±0.03               |           | n=3       | soybean + grain (wheat) |                         |
|           | 42      | 1.59±0.03               |           | n=3       | soybean + grain (wheat) |                         |
|           | 43      | 2.11±0.01               |           | n=3       | soybean + grain (wheat) |                         |
|           | 44      | 1.83±0.03               |           | n=3       | soybean + grain (wheat) |                         |
|           | 45      | 2.33±0.04               |           | n=3       | only soybean            |                         |
|           | 46      | 1.89±0.01               |           | n=3       | soybean + grain (wheat) |                         |
|           | 47      | 1.77±0.00               |           | n=3       | soybean + grain (wheat) |                         |
|           | 48      | 1.87±0.01               |           | n=3       | soybean + grain (wheat) |                         |
|           | 49      | 3.53±0.04               |           | n=3       | only soybean            |                         |
|           | Mean±SD |                         | 2.03±0.38 |           |                         |                         |
|           | MAX     |                         | 3.53      |           |                         |                         |
|           | MIN     |                         | 1.32      |           |                         |                         |
| Japan     | 1       | D                       | 3.07±0.00 | n=2       | only soybean            |                         |

|    |            |     |                                |
|----|------------|-----|--------------------------------|
| 2  | 2.86±0.00  | n=2 | only soybean                   |
| 3  | 3.28±0.02  | n=2 | only soybean                   |
| 4  | 2.96±0.01  | n=2 | only soybean                   |
| 5  | 2.95±0.03  | n=2 | only soybean                   |
| 6  | 2.85±0.01  | n=2 | only soybean                   |
| 7  | 3.02±0.01  | n=2 | only soybean                   |
| 8  | 2.85±0.03  | n=2 | only soybean                   |
| 9  | 2.73±0.01  | n=2 | only soybean                   |
| 10 | 2.87±0.00  | n=2 | only soybean                   |
| 11 | 1.38±0.01  | n=2 | soybean + grain (rice)         |
| 12 | 1.28±0.00  | n=2 | soybean + grain (rice)         |
| 13 | 1.46±0.00  | n=2 | soybean + grain (rice)         |
| 14 | 1.26±0.00  | n=2 | soybean + grain (rice)         |
| 15 | 1.21±0.00  | n=2 | soybean + grain (rice)         |
| 16 | 1.35±0.01  | n=2 | soybean + grain (rice)         |
| 17 | 1.39±0.01  | n=2 | soybean + grain (rice)         |
| 18 | 1.50±0.02  | n=2 | soybean + grain (rice)         |
| 19 | 1.43±0.03  | n=2 | soybean + grain (rice)         |
| 20 | 1.74±0.03  | n=2 | soybean + grain (rice)         |
| 21 | 1.19±0.01  | n=2 | soybean + grain (rice)         |
| 22 | 1.73±0.00  | n=2 | soybean + grain (rice)         |
| 23 | 1.44±0.00  | n=2 | soybean + grain (rice)         |
| 24 | 1.62±0.00  | n=2 | soybean + grain (rice)         |
| 25 | 1.65±0.00  | n=2 | soybean + grain (rice)         |
| 26 | 1.84±0.01  | n=2 | soybean + grain (rice)         |
| 27 | 1.61±0.00  | n=2 | soybean + grain (rice)         |
| 28 | 1.56±0.00  | n=2 | soybean + grain (rice)         |
| 29 | 1.92±0.01  | n=2 | soybean + grain (rice)         |
| 30 | 1.96±0.01  | n=2 | soybean + grain (rice)         |
| 31 | 1.91±0.00  | n=2 | soybean + grain (rice)         |
| 32 | 1.94±0.00  | n=2 | soybean + grain (rice)         |
| 33 | 1.82±0.02  | n=2 | soybean + grain (rice)         |
| 34 | 1.91±0.01  | n=2 | soybean + grain (rice)         |
| 35 | 2.00±0.00  | n=2 | soybean + grain (rice)         |
| 36 | 1.64±0.00  | n=2 | soybean + grain (rice)         |
| 37 | 1.73±0.02  | n=2 | soybean + grain (rice)         |
| 38 | 1.74±0.01  | n=2 | soybean + grain (rice)         |
| 39 | 1.87±0.01  | n=2 | soybean + grain (rice)         |
| 40 | 1.95±0.00  | n=2 | soybean + grain (rice)         |
| 41 | 1.78±0.01  | n=2 | soybean + grain (rice)         |
| 42 | 1.91±0.00  | n=2 | soybean + grain (rice)         |
| 43 | 1.76±0.01  | n=2 | soybean + grain (rice)         |
| 44 | 2.05±0.00  | n=2 | soybean + grain (rice)         |
| 45 | 2.00±0.00  | n=2 | soybean + grain (rice)         |
| 46 | 1.93±0.00  | n=2 | soybean + grain (rice)         |
| 47 | 2.52±0.01  | n=2 | soybean + grain (rice)         |
| 48 | 2.68±0.00  | n=2 | soybean + grain (rice)         |
| 49 | 1.96±0.00  | n=2 | soybean + grain (rice)         |
| 50 | 1.83±0.01  | n=2 | soybean + grain (rice)         |
| 51 | 1.84±0.00  | n=2 | soybean + grain (rice)         |
| 52 | 1.89±0.01  | n=2 | soybean + grain (rice)         |
| 53 | 1.77±0.00  | n=2 | soybean + grain (rice)         |
| 54 | 1.96±0.00  | n=2 | soybean + grain (rice)         |
| 55 | 1.12±0.00  | n=2 | soybean + grain (rice, barley) |
| 56 | 0.61±0.00  | n=2 | soybean + grain (rice, barley) |
| 57 | 1.69±0.01  | n=2 | soybean + grain (rice, barley) |
| 58 | 1.30±0.00  | n=2 | soybean + grain (rice, barley) |
| 59 | 1.49±0.01  | n=2 | soybean + grain (rice, barley) |
| 60 | 1.69±0.01  | n=2 | soybean + grain (rice, barley) |
| 61 | 1.69±0.00  | n=2 | soybean + grain (rice, barley) |
| 62 | 1.60 ±0.01 | n=2 | soybean + grain (rice, barley) |
| 63 | 1.41±0.00  | n=2 | soybean + grain (rice, barley) |

|         |           |           |                         |                                |
|---------|-----------|-----------|-------------------------|--------------------------------|
| 64      |           | 0.76±0.01 | n=2                     | soybean + grain (rice, barley) |
| 65      |           | 0.80±0.01 | n=2                     | soybean + grain (rice, barley) |
| 66      |           | 0.72±0.00 | n=2                     | soybean + grain (rice, barley) |
| 67      |           | 0.73±0.00 | n=2                     | soybean + grain (rice, barley) |
| 68      |           | 1.58±0.01 | n=2                     | soybean + grain (rice, barley) |
| 69      |           | 1.56±0.00 | n=2                     | soybean + grain (rice, barley) |
| 70      |           | 1.30±0.01 | n=2                     | soybean + grain (rice, barley) |
| 71      |           | 1.34±0.03 | n=2                     | soybean + grain (rice, barley) |
| 72      |           | 1.22±0.01 | n=2                     | soybean + grain (rice, barley) |
| 73      |           | 1.52±0.01 | n=2                     | soybean + grain (rice, barley) |
| 74      |           | 1.27±0.00 | n=2                     | soybean + grain (rice, barley) |
| 75      |           | 1.65±0.00 | n=2                     | soybean + grain (rice, barley) |
| 76      |           | 1.58±0.01 | n=2                     | soybean + grain (rice, barley) |
| 77      |           | 1.09±0.00 | n=2                     | soybean + grain (rice, barley) |
| 78      |           | 1.05±0.00 | n=2                     | soybean + grain (rice, barley) |
| 79      |           | 1.19±0.02 | n=2                     | soybean + grain (rice, barley) |
| 80      |           | 1.24±0.00 | n=2                     | soybean + grain (rice, barley) |
| 81      |           | 1.40±0.00 | n=2                     | soybean + grain (rice, barley) |
| 82      |           | 1.58±0.00 | n=2                     | soybean + grain (rice, barley) |
| 83      |           | 1.77±0.03 | n=2                     | soybean + grain (rice, barley) |
| 84      |           | 1.58±0.02 | n=2                     | soybean + grain (rice, barley) |
| 85      |           | 1.42±0.00 | n=2                     | soybean + grain (rice, barley) |
| 86      |           | 1.46±0.01 | n=2                     | soybean + grain (rice, barley) |
| 87      |           | 1.51±0.01 | n=2                     | soybean + grain (rice, barley) |
| 88      |           | 1.84±0.00 | n=2                     | soybean + grain (rice, barley) |
| 89      |           | 1.67±0.00 | n=2                     | soybean + grain (rice, barley) |
| 90      |           | 1.71±0.00 | n=2                     | soybean + grain (rice, barley) |
| 91      | E         | 2.36±0.02 | n=2                     | only soybean                   |
| 92      |           | 1.60±0.00 | n=2                     | only soybean                   |
| 93      |           | 1.66±0.01 | n=2                     | only soybean                   |
| 94      |           | 1.88±0.01 | n=2                     | only soybean                   |
| 95      |           | 2.10±0.00 | n=2                     | soybean + grain (wheat)        |
| 96      |           | 2.43±0.02 | n=2                     | soybean + grain (wheat)        |
| 97      |           | 1.36±0.01 | n=2                     | soybean + grain (wheat)        |
| 98      |           | 1.42±0.00 | n=2                     | soybean + grain (wheat)        |
| 99      | F         | 2.25±0.00 | n=2                     | only soybean                   |
| 100     |           | 1.96±0.02 | n=2                     | soybean + grain (wheat)        |
| 101     |           | 2.06±0.00 | n=2                     | soybean + grain (wheat)        |
| 102     |           | 2.07±0.01 | n=2                     | soybean + grain (wheat)        |
| 103     |           | 2.10±0.00 | n=2                     | soybean + grain (wheat)        |
| 104     |           | 2.10±0.00 | n=2                     | soybean + grain (wheat)        |
| 105     | 2.00±0.00 | n=2       | soybean + grain (wheat) |                                |
| Mean±SD |           | 1.76±0.53 |                         |                                |
| MAX     |           | 3.28      |                         |                                |
| MIN     |           | 0.61      |                         |                                |
| Mean±SD |           | 1.84±0.50 |                         |                                |
| MAX     |           | 3.53      |                         |                                |
| MIN     |           | 0.61      |                         |                                |

**Table 2** Content of amino nitrogen in different fermented soybean paste test samples (analysis method: AOAC 920.154B)

(unit: %)

| Tested in | Sample | Country of manufacture | Mean±SD     | Remarks | Ingredients             |
|-----------|--------|------------------------|-------------|---------|-------------------------|
| Korea     | 1      | A                      | 0.714±0.011 | n=12    | only soybean            |
|           | 2      |                        | 0.420±0.018 | n=3     | soybean + grain (wheat) |
|           | 3      |                        | 0.482±0.012 | n=3     | soybean + grain (wheat) |
|           | 4      |                        | 0.479±0.010 | n=3     | only soybean            |
|           | 5      |                        | 0.520±0.010 | n=3     | soybean + grain (wheat) |
|           | 6      |                        | 0.952±0.020 | n=3     | only soybean            |
|           | 7      |                        | 0.356±0.010 | n=3     | soybean + grain (wheat) |
|           | 8      |                        | 0.385±0.000 | n=3     | only soybean            |

|       |    |             |              |             |                         |                         |
|-------|----|-------------|--------------|-------------|-------------------------|-------------------------|
|       | 9  |             | 0.998±0.000  | n=3         | only soybean            |                         |
|       | 10 |             | 0.666±0.018  | n=3         | only soybean            |                         |
|       | 11 |             | 0.660±0.010  | n=3         | only soybean            |                         |
|       | 12 |             | 0.526±0.000  | n=3         | only soybean            |                         |
|       | 13 |             | 1.069±0.000  | n=3         | only soybean            |                         |
|       | 14 |             | 1.220±0.010  | n=3         | only soybean            |                         |
|       | 15 | B           | 0.380±0.014  | n=12        | soybean + grain (rice)  |                         |
|       | 16 |             | 0.377±0.012  | n=3         | soybean + grain (rice)  |                         |
|       | 17 |             | 0.324±0.012  | n=3         | soybean + grain (rice)  |                         |
|       | 18 |             | 0.461±0.010  | n=3         | soybean + grain (rice)  |                         |
|       | 19 |             | 0.321±0.010  | n=3         | soybean + grain (rice)  |                         |
|       | 20 |             | 0.327±0.010  | n=3         | soybean + grain (rice)  |                         |
|       | 21 |             | 0.403±0.000  | n=3         | soybean + grain (rice)  |                         |
|       | 22 |             | 0.234±0.010  | n=3         | soybean + grain (rice)  |                         |
|       | 23 |             | 0.426±0.010  | n=3         | soybean + grain (rice)  |                         |
|       | 24 |             | 0.391±0.010  | n=3         | soybean + grain (rice)  |                         |
|       | 25 |             | 0.309±0.010  | n=3         | soybean + grain (rice)  |                         |
|       | 26 |             | 0.385±0.000  | n=3         | soybean + grain (rice)  |                         |
|       | 27 |             | 0.350±0.000  | n=3         | soybean + grain (rice)  |                         |
|       | 28 |             | 0.368±0.000  | n=3         | soybean + grain (rice)  |                         |
|       | 29 |             | 0.159±0.004  | n=3         | soybean + grain (rice)  |                         |
|       | 30 |             | 0.154±0.007  | n=3         | soybean + grain (rice)  |                         |
|       | 31 |             | 0.378±0.007  | n=3         | soybean + grain (rice)  |                         |
|       | 32 |             | 0.374±0.011  | n=3         | soybean + grain (rice)  |                         |
|       | 33 |             | 0.196±0.007  | n=3         | soybean + grain (rice)  |                         |
|       | 34 |             | 0.285±0.008  | n=3         | soybean + grain (rice)  |                         |
|       | 35 |             | 0.255±0.008  | n=3         | soybean + grain (rice)  |                         |
|       | 36 |             | C            | 0.750±0.018 | n=12                    | soybean + grain (wheat) |
|       | 37 |             |              | 0.657±0.012 | n=3                     | soybean + grain (wheat) |
|       | 38 |             |              | 0.689±0.010 | n=3                     | soybean + grain (wheat) |
|       | 39 |             |              | 0.736±0.000 | n=3                     | soybean + grain (wheat) |
|       | 40 |             |              | 0.666±0.018 | n=3                     | soybean + grain (wheat) |
|       | 41 |             |              | 0.482±0.012 | n=3                     | soybean + grain (wheat) |
|       | 42 |             |              | 0.309±0.010 | n=3                     | soybean + grain (wheat) |
|       | 43 | 0.712±0.010 |              | n=3         | soybean + grain (wheat) |                         |
|       | 44 | 1.015±0.002 |              | n=3         | soybean + grain (wheat) |                         |
|       | 45 | 1.086±0.018 |              | n=3         | only soybean            |                         |
|       | 46 | 0.673±0.007 |              | n=3         | soybean + grain (wheat) |                         |
|       | 47 | 0.675±0.008 |              | n=3         | soybean + grain (wheat) |                         |
|       | 48 | 0.747±0.011 |              | n=3         | soybean + grain (wheat) |                         |
|       | 49 | 0.528±0.004 |              | n=3         | only soybean            |                         |
|       |    | Mean±SD     | 0.531±0.258  |             |                         |                         |
|       |    | MAX         | 1.220        |             |                         |                         |
|       |    | MIN         | 0.154        |             |                         |                         |
| Japan | 1  | D           | 0.968±0.003  | n=3         | only soybean            |                         |
|       | 2  |             | 0.860±0.012  | n=3         | only soybean            |                         |
|       | 3  |             | 0.745±0.007  | n=3         | only soybean            |                         |
|       | 4  |             | 0.724±0.024  | n=3         | only soybean            |                         |
|       | 5  |             | 0.827±0.023  | n=3         | only soybean            |                         |
|       | 6  |             | 0.763±0.002  | n=3         | only soybean            |                         |
|       | 7  |             | 0.860±0.008  | n=3         | only soybean            |                         |
|       | 8  |             | 0.790±0.027  | n=3         | only soybean            |                         |
|       | 9  |             | 0.762±0.024  | n=3         | only soybean            |                         |
|       | 10 |             | 0.8260±0.010 | n=3         | only soybean            |                         |
|       | 11 |             | 0.213±0.011  | n=3         | soybean + grain (rice)  |                         |
|       | 12 |             | 0.200±0.002  | n=3         | soybean + grain (rice)  |                         |
|       | 13 |             | 0.195±0.009  | n=3         | soybean + grain (rice)  |                         |
|       | 14 |             | 0.200±0.005  | n=3         | soybean + grain (rice)  |                         |
|       | 15 |             | 0.345±0.013  | n=3         | soybean + grain (rice)  |                         |
|       | 16 |             | 0.268±0.010  | n=3         | soybean + grain (rice)  |                         |
|       | 17 |             | 0.294±0.002  | n=3         | soybean + grain (rice)  |                         |
|       | 18 |             | 0.291±0.010  | n=3         | soybean + grain (rice)  |                         |



|    |             |     |                                |
|----|-------------|-----|--------------------------------|
| 19 | 0.224±0.008 | n=3 | soybean + grain (rice)         |
| 20 | 0.357±0.013 | n=3 | soybean + grain (rice)         |
| 21 | 0.165±0.017 | n=3 | soybean + grain (rice)         |
| 22 | 0.275±0.009 | n=3 | soybean + grain (rice)         |
| 23 | 0.312±0.002 | n=3 | soybean + grain (rice)         |
| 24 | 0.313±0.009 | n=3 | soybean + grain (rice)         |
| 25 | 0.391±0.014 | n=3 | soybean + grain (rice)         |
| 26 | 0.425±0.016 | n=3 | soybean + grain (rice)         |
| 27 | 0.404±0.003 | n=3 | soybean + grain (rice)         |
| 28 | 0.381±0.016 | n=3 | soybean + grain (rice)         |
| 29 | 0.465±0.007 | n=3 | soybean + grain (rice)         |
| 30 | 0.408±0.001 | n=3 | soybean + grain (rice)         |
| 31 | 0.400±0.013 | n=3 | soybean + grain (rice)         |
| 32 | 0.432±0.020 | n=3 | soybean + grain (rice)         |
| 33 | -           | -   | soybean + grain (rice)         |
| 34 | 0.367±0.016 | n=3 | soybean + grain (rice)         |
| 35 | 0.438±0.012 | n=3 | soybean + grain (rice)         |
| 36 | 0.356±0.013 | n=3 | soybean + grain (rice)         |
| 37 | 0.331±0.003 | n=3 | soybean + grain (rice)         |
| 38 | 0.481±0.006 | n=3 | soybean + grain (rice)         |
| 39 | 0.385±0.007 | n=3 | soybean + grain (rice)         |
| 40 | 0.447±0.008 | n=3 | soybean + grain (rice)         |
| 41 | 0.374±0.003 | n=3 | soybean + grain (rice)         |
| 42 | 0.415±0.006 | n=3 | soybean + grain (rice)         |
| 43 | 0.432±0.008 | n=3 | soybean + grain (rice)         |
| 44 | 0.495±0.005 | n=3 | soybean + grain (rice)         |
| 45 | 0.409±0.007 | n=3 | soybean + grain (rice)         |
| 46 | 0.415±0.011 | n=3 | soybean + grain (rice)         |
| 47 | 0.603±0.010 | n=3 | soybean + grain (rice)         |
| 48 | 0.660±0.016 | n=3 | soybean + grain (rice)         |
| 49 | 0.363±0.010 | n=3 | soybean + grain (rice)         |
| 50 | 0.426±0.012 | n=3 | soybean + grain (rice)         |
| 51 | 0.374±0.020 | n=3 | soybean + grain (rice)         |
| 52 | 0.420±0.010 | n=3 | soybean + grain (rice)         |
| 53 | 0.395±0.009 | n=3 | soybean + grain (rice)         |
| 54 | 0.398±0.007 | n=3 | soybean + grain (rice)         |
| 55 | -           | -   | soybean + grain (rice, barley) |
| 56 | 0.098±0.005 | n=3 | soybean + grain (rice, barley) |
| 57 | 0.381±0.008 | n=3 | soybean + grain (rice, barley) |
| 58 | 0.324±0.008 | n=3 | soybean + grain (rice, barley) |
| 59 | 0.373±0.028 | n=3 | soybean + grain (rice, barley) |
| 60 | 0.386±0.012 | n=3 | soybean + grain (rice, barley) |
| 61 | 0.340±0.008 | n=3 | soybean + grain (rice, barley) |
| 62 | 0.358±0.005 | n=3 | soybean + grain (rice, barley) |
| 63 | 0.356±0.005 | n=3 | soybean + grain (rice, barley) |
| 64 | 0.190±0.008 | n=3 | soybean + grain (rice, barley) |
| 65 | 0.162±0.016 | n=3 | soybean + grain (rice, barley) |
| 66 | -           | -   | soybean + grain (rice, barley) |
| 67 | -           | -   | soybean + grain (rice, barley) |
| 68 | 0.383±0.008 | n=3 | soybean + grain (rice, barley) |
| 69 | 0.335±0.002 | n=3 | soybean + grain (rice, barley) |
| 70 | 0.314±0.021 | n=3 | soybean + grain (rice, barley) |
| 71 | 0.387±0.003 | n=3 | soybean + grain (rice, barley) |
| 72 | 0.279±0.007 | n=3 | soybean + grain (rice, barley) |
| 73 | 0.326±0.019 | n=3 | soybean + grain (rice, barley) |
| 74 | 0.283±0.009 | n=3 | soybean + grain (rice, barley) |
| 75 | 0.423±0.005 | n=3 | soybean + grain (rice, barley) |
| 76 | 0.422±0.007 | n=3 | soybean + grain (rice, barley) |
| 77 | 0.271±0.011 | n=3 | soybean + grain (rice, barley) |
| 78 | 0.265±0.023 | n=3 | soybean + grain (rice, barley) |
| 79 | 0.253±0.003 | n=3 | soybean + grain (rice, barley) |
| 80 | 0.321±0.011 | n=3 | soybean + grain (rice, barley) |

|         |   |             |     |                                |
|---------|---|-------------|-----|--------------------------------|
| 81      |   | 0.389±0.008 | n=3 | soybean + grain (rice, barley) |
| 82      |   | 0.490±0.004 | n=3 | soybean + grain (rice, barley) |
| 83      |   | 0.423±0.038 | n=3 | soybean + grain (rice, barley) |
| 84      |   | 0.377±0.010 | n=3 | soybean + grain (rice, barley) |
| 85      |   | 0.284±0.003 | n=3 | soybean + grain (rice, barley) |
| 86      |   | 0.356±0.016 | n=3 | soybean + grain (rice, barley) |
| 87      |   | 0.407±0.015 | n=3 | soybean + grain (rice, barley) |
| 88      |   | 0.438±0.002 | n=3 | soybean + grain (rice, barley) |
| 89      |   | 0.451±0.034 | n=3 | soybean + grain (rice, barley) |
| 90      |   | 0.498±0.020 | n=3 | soybean + grain (rice, barley) |
| 91      | E | 0.613±0.015 | n=3 | only soybean                   |
| 92      |   | 0.648±0.006 | n=3 | only soybean                   |
| 93      |   | 0.740±0.002 | n=3 | only soybean                   |
| 94      |   | 1.036±0.011 | n=3 | only soybean                   |
| 95      |   | 0.635±0.003 | n=3 | soybean + grain (wheat)        |
| 96      |   | 0.514±0.026 | n=3 | soybean + grain (wheat)        |
| 97      |   | 0.653±0.015 | n=3 | soybean + grain (wheat)        |
| 98      |   | 0.299±0.008 | n=3 | soybean + grain (wheat)        |
| 99      | F | 0.436±0.011 | n=3 | only soybean                   |
| 100     |   | 0.344±0.013 | n=3 | soybean + grain (wheat)        |
| 101     |   | 0.445±0.007 | n=3 | soybean + grain (wheat)        |
| 102     |   | 0.416±0.006 | n=3 | soybean + grain (wheat)        |
| 103     |   | 0.268±0.012 | n=3 | soybean + grain (wheat)        |
| 104     |   | 0.255±0.009 | n=3 | soybean + grain (wheat)        |
| 105     |   | 0.342±0.018 | n=3 | soybean + grain (wheat)        |
| Mean±SD |   | 0.426±0.182 |     |                                |
| MAX     |   | 1.036       |     |                                |
| MIN     |   | 0.098       |     |                                |
| Mean±SD |   | 0.461±0.215 |     |                                |
| MAX     |   | 1.220       |     |                                |
| MIN     |   | 0.098       |     |                                |

**Table 3** Content of moisture in different fermented soybean paste test samples (analysis method: AOAC 934.01)

(unit: %)

| Sample | Country of manufacture | Mean±SD    | Remarks | Ingredients             |
|--------|------------------------|------------|---------|-------------------------|
| 1      | A                      | 47.32±0.33 | n=12    | only soybean            |
| 2      |                        | 45.66±1.03 | n=3     | soybean + grain (wheat) |
| 3      |                        | 52.21±0.93 | n=3     | soybean + grain (wheat) |
| 4      |                        | 45.67±0.61 | n=3     | only soybean            |
| 5      |                        | 46.22±0.34 | n=3     | soybean + grain (wheat) |
| 6      |                        | 51.04±0.35 | n=3     | only soybean            |
| 7      |                        | 48.69±0.39 | n=3     | soybean + grain (wheat) |
| 8      |                        | 49.59±0.68 | n=3     | only soybean            |
| 9      |                        | 53.53±0.19 | n=3     | only soybean            |
| 10     |                        | 54.71±0.05 | n=3     | only soybean            |
| 11     |                        | 53.97±0.38 | n=3     | only soybean            |
| 12     |                        | 56.54±0.22 | n=3     | only soybean            |
| 13     |                        | 55.04±0.39 | n=3     | only soybean            |
| 14     |                        | 52.19±0.04 | n=3     | only soybean            |
| 15     | B                      | 49.68±0.37 | n=12    | soybean + grain (rice)  |
| 16     |                        | 52.20±0.70 | n=3     | soybean + grain (rice)  |
| 17     |                        | 46.78±0.45 | n=3     | soybean + grain (rice)  |
| 18     |                        | 48.80±0.40 | n=3     | soybean + grain (rice)  |
| 19     |                        | 48.67±0.11 | n=3     | soybean + grain (rice)  |
| 20     |                        | 50.87±0.67 | n=3     | soybean + grain (rice)  |
| 21     |                        | 50.45±0.05 | n=3     | soybean + grain (rice)  |
| 22     |                        | 43.21±0.34 | n=3     | soybean + grain (rice)  |
| 23     |                        | 48.32±0.35 | n=3     | soybean + grain (rice)  |
| 24     |                        | 42.34±0.55 | n=3     | soybean + grain (rice)  |
| 25     |                        | 46.47±0.25 | n=3     | soybean + grain (rice)  |
| 26     |                        | 52.52±0.30 | n=3     | soybean + grain (rice)  |

|              |   |            |      |                         |
|--------------|---|------------|------|-------------------------|
| 27           |   | 48.18±0.75 | n=3  | soybean + grain (rice)  |
| 28           |   | 48.61±0.58 | n=3  | soybean + grain (rice)  |
| 29           |   | 43.50±0.24 | n=3  | soybean + grain (rice)  |
| 30           |   | 39.30±0.22 | n=3  | soybean + grain (rice)  |
| 31           |   | 46.08±0.18 | n=3  | soybean + grain (rice)  |
| 32           |   | 42.06±0.12 | n=3  | soybean + grain (rice)  |
| 33           |   | 45.18±0.06 | n=3  | soybean + grain (rice)  |
| 34           |   | 46.82±0.08 | n=3  | soybean + grain (rice)  |
| 35           |   | 45.83±0.15 | n=3  | soybean + grain (rice)  |
| 36           | C | 54.52±0.78 | n=12 | soybean + grain (wheat) |
| 37           |   | 56.19±0.28 | n=3  | soybean + grain (wheat) |
| 38           |   | 52.52±0.40 | n=3  | soybean + grain (wheat) |
| 39           |   | 52.01±0.50 | n=3  | soybean + grain (wheat) |
| 40           |   | 55.20±0.11 | n=3  | soybean + grain (wheat) |
| 41           |   | 55.17±0.30 | n=3  | soybean + grain (wheat) |
| 42           |   | 48.62±0.60 | n=3  | soybean + grain (wheat) |
| 43           |   | 56.98±0.35 | n=3  | soybean + grain (wheat) |
| 44           |   | 53.88±0.15 | n=3  | soybean + grain (wheat) |
| 45           |   | 54.66±0.29 | n=3  | only soybean            |
| 46           |   | 53.25±0.16 | n=3  | soybean + grain (wheat) |
| 47           |   | 52.07±0.07 | n=3  | soybean + grain (wheat) |
| 48           |   | 53.49±0.11 | n=3  | soybean + grain (wheat) |
| 49           |   | 35.03±0.26 | n=3  | only soybean            |
| Ave(Mean)±SD |   | 49.63±4.75 |      |                         |
| MAX          |   | 56.98      |      |                         |
| MIN          |   | 35.03      |      |                         |

**Appendix II**

Proposal on the Quality Factors of Fermented Soybean Paste  
(Comments from Japan)

Japan appreciates the hard work of the Republic of Korea in revising a proposal on the quality factors of fermented soybean paste based on the products data from different countries.

We would like to submit some additional data of our products regarding total nitrogen and amino nitrogen for the consideration of the numerical values of the quality factors. We found that some products using grain as its optional ingredients showed lower numerical values than the proposed ones.

As it was agreed that the Codex Standards should be inclusive of all products traded within commodity groups rather than highly specific standards<sup>2</sup>, we would like to modify the proposed numerical values as follows to cover some products found in the above research.

Products using grains in addition to soybeans,

Total nitrogen: from “no less than 0.8%” to “no less than 0.6%”

Amino nitrogen: from “no less than 0.15%” to “no less than 0.10%”

*Table 1 Comparison of proposals on the quality factors of fermented soybean products*

|                | 15 <sup>th</sup> CCASIA | Revised Proposal |        |        |
|----------------|-------------------------|------------------|--------|--------|
|                |                         |                  | Korea  | Japan  |
| Total nitrogen | ≥1.2%                   | soy only         | ≥1.6%  | ≥1.6%  |
|                |                         | soy+grain        | ≥0.8%  | ≥0.6%  |
| Amino nitrogen | ≥0.25%                  | soy only         | ≥0.3%  | ≥0.3%  |
|                |                         | soy+grain        | ≥0.15% | ≥0.10% |
| Moisture       | ≤60.0%                  |                  | ≤60.0% | ≤60.0% |

1.

<sup>2</sup> ALINORM 99/3, para. 27,