CODEX ALIMENTARIUS COMMISSION

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World Health Organization

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Agenda Item 6 **CX/PFV 12/26/6**
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JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON PROCESSED FRUITS AND VEGETABLES

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Montego Bay, Jamaica,
15 – 19 October 2012

PROPOSED DRAFT SAMPLING PLANS INCLUDING METROLOGICAL PROVISIONS FOR CONTROLLING MINIMUM DRAINED WEIGHT OF CANNED FRUITS AND VEGETABLES IN PACKING MEDIA

(At Step 3)

(Prepared by the Electronic Working Group on Sampling Plans led by France)

Codex Members and Observers wishing to submit comments on this proposal should do so in conformity with the Uniform Procedure for the Elaboration of Codex Standards and Related Texts (Codex Alimentarius Procedural Manual) as presented in Appendix I before **30 September 2012**. Comments should be addressed:	
to: US Codex Office, Food Safety and Inspection Service, US Department of Agriculture, Room 4861 South Building, 1400 Independence Ave., S.W., Washington, D.C. 20250-3700 USA E-mail: uscodex@fsis.usda.gov; ccpfv@fsis.usda.gov	with copy to: Secretariat, Codex Alimentarius Commission, Joint FAO/WHO Food Standards Programme, Viale delle Terme di Caracalla, 00153 Rome, Italy E-mail: codex@fao.org
Format for submitting comments: In order to facilitate the compilation of comments and prepare a more useful comments document, Members and Observers, which are not yet doing so, are requested to provide their comments in the format outlined in Appendix II to this document.	

BACKGROUND

1. The proposed draft Sampling Plan including Metrological Provisions for controlling Minimum Drained Weight of Canned Fruits and Vegetables in Packing Media was presented and discussed at the 25th Session of the Committee on Processed Fruits and Vegetables (October 2010). The conclusions[1] of the discussion on this matter were:

- The Committee agreed that the further simplification of the proposed draft sampling plans should be considered together with the proposal for an alternative approach to "unreasonable shortage" by the delegation of the United States of America (CRD 24)[2]. This work was entrusted to an electronic working group, led by France, open to all members and observers and working in English only.
- It was further agreed that should no compromise be reached on a sampling plan revising the existing proposal for the control of minimum drained weight at the next session, the Committee will discontinue work on the sampling plan for including metrological provisions for controlling minimum drained weight of canned fruits and vegetables in packing media.

1 REP11/PFV, paras. 104-105. Further details on the discussion of this item are available in the report of the session on the Codex website: www.codexalimentarius.org

2 Working documents presented at the 25th Session of the CCPFV including conference room documents (CRDs) are available on the Codex website or by direct ftp-link: ftp://ftp.fao.org/codex/meetings/ccpfv/ccpfv25

1 **The Working group**

2. The proposed draft was the object of a first round for comments on December 19th, 2011 for return on February 18th, 2012, and two comments were received. The second round of comments organized on April 11th, 2012 for a return of comments on May 21st, 2012: no comment was received.

2 The proposed draft

3. The proposed draft presented at the 25th session of the CCPFV was simplified for the 1st round of comments of the working group, in order to take into account the comments from the members of the CCPFV,

- the presentation of the draft was simplified in order to allow a better use by operators;
- the content was aligned with the provisions of the international standards: R87 recommendations of the International Organization of Legal Metrology (OIML), the General Guidelines on Sampling (CAC/GL 50-2004), ISO standards, 2859, 2854-1976, and 3494-1976;
- the proposed draft, which is a reference document, is accompanied by a control card intended for inspectors for official inspection.

4. For the 2nd round of comments the draft was again simplified to have an easily usable practical document by inspectors; this allowed in particular to reply to the comments of the United States of America which specified: " *the proposed draft sampling plan is written at an academic /statistical level that is inappropriate for application by the majority of inspectors. "*

5. In the absence of new comments for this second round, it is this document, which is appended to this report.

- The proposed draft is a reference document that shows a statistical security: the annex with the mathematic formula is deleted; it contains the scope, the definitions, the metrological requirements and the procedure to determine the drained weight.
- The contents of this reference document and the procedure are presented in the form of an index card easily understandable for inspectors (Testing plan in Annex 1)
- An inspection card for official inspection is in Annex 2
- An inspection card for official inspection with an example of test is in Annex 3.

3 The USA proposal

6. The United States of America sent again to the working group their proposal already presented during the 25th session in CRD 6. This proposal was sent during the first round and during the second round to the members of the working group.

In the absence of comments on this proposal, the remarks and the following questions can be made:

- The procedure to be followed if the size of the lot is less than 12,000 units and more than 39,000 units.
- The question of the consideration of the dispersal of the values of the drained weight measured in the sample.
- The conditions of the choice between the two possibilities indicated in the proposal (drained weight lower than 45% of the capacity and drained weight lower than the nominal drained weight (declared) less the average of one unit).
- The method to determine the average size unit (the size of the units varies according to the sizes and the styles of the products, the nature of the product: peas, or pieces of mushrooms or half-pears).

7. The compliance with the such required by the General Guidelines on Sampling (CAC/GL 50-2004), in order to be opposable in third parties in case of a dispute or in front of the courts in case of contentious procedure.

4 Conclusions

8. The new draft proposal answers completely the request for simplification. However this simplification, the proposed methods offer statistical security both for operators and for buyers and the consumers, and the plan is in compliance with the General Guidelines on Sampling (CAC/GL 50-2004). It is already used by inspectors in others countries.

1) The sampling plan proposed is a **sampling plan by attributes** in conformity with the ISO standards, 2859;
2) In order to permit to the official inspection to evaluate the conformity of lot, it includes **a double test**:
    - check of the average of the real drained net weight in the sample,
    - check of the real drained net weight of each sample to determine the number of items that have a drained net weight lower than the tolerable minimum drained net weight, i.e. the nominal drained net weight less the tolerable negative error.
3) The double test allows, by introducing an individual pre-package error, **to limit the deviation** (s) and obtain manufactured products more homogeneous for the operators and to the benefit of consumers.

4) The proposed sampling plan applies to **lots of more than 100 units** (prepackages) and includes one size for the sample: 20 units for a lot size over 100 to 10,000 prepackages.

5) **The proposed draft is a reference document** which is not used by inspectors at the time of the inspection; they use an **inspection card** easy to understand; this type of card is attached in Annex 2. An example of using this card is attached in Annex 3.

APPENDIX I

PROPOSED DRAFT SAMPLING PLANS INCLUDING METROLOGICAL PROVISIONS FOR CONTROLLING MINIMUM DRAINED WEIGHT OF CANNED FRUITS AND VEGETABLES IN PACKING MEDIA

PROPOSED DRAFT SAMPLING PLANS FOR THE METROLOGICAL CONTROL OF MINIMUM DRAINED WEIGHT OF CANNED FRUITS AND VEGETABLES IN LIQUID PACKING MEDIA IN RIGID CONTAINERS[1]

1. SCOPE

The sampling plan applies to canned fruits and vegetables presented in a packing medium in rigid containers for which specific product standards require a declaration of drained net weight:

- Legal metrology requirements for some prepackaged products labelled in predetermined constant nominal quantities of weight.
- Sampling plans and procedures for use by legal metrology officials in verifying the quantity of product in prepackages.

  Note: the sampling plans are not for use in the quantity control processes of prepackers.

This sampling plan conforms with the R87 recommendations of the International Organization of Legal Metrology (OIML) and the indications in the Codex guidelines on sampling (CAC/GL 50-2004).

The purpose of the metrological control of the content of pre-packages is to ensure that the average drained net content of a lot is at least equal to the drained net weight declared on the pre-package labelling, and that the difference between the actual content of each container and the drained net weight declared is as limited as possible.

(a) Control of the actual drained net content of each pre-package uses sampling plans by attributes whose principles are presented in the ISO 2859 standards.

(b) Control of average drained net content is a comparative test of the average drained net content of prepackages of a sample extracted from the lot under inspection; the statistical principle of this test is presented in ISO standards 2854-1976, and 3494-1976.

2. DEFINITIONS

2.1 NOMINAL WEIGHT

Quantity of product in a pre-package, including the liquid medium, declared on the label by the packager.

2.2 NOMINAL DRAINED WEIGHT[1] (QN)

Quantity of product in a pre-package less the liquid medium, declared on the label by the packager.

The symbol Qn is used to designate the nominal drained weight.

The nominal drained weight must be declared in accordance with the General Standard for the Labelling of Pre-packaged Foods (CODEX STAN 1-1985).

2.3 ACTUAL DRAINED WEIGHT

Quantity of product in a pre-package after equilibrium of solution is established and the liquid medium has been drained according the test methods in Section 5.2.

2.4 LIQUID MEDIUM OR PACKING MEDIA

The packing media are defined in the Guidelines on Packing Media for Canned Fruits (CAC/GL 51-2003) and in the Standard for Certain Canned Vegetables (CODEX STAN 297-2009), with in addition to the specific provisions in each commodity standard.

The following media, possibly in mixtures, provided that the liquid is merely an adjunct to the essential elements of that preparation (and is not a decisive factor for the purchase): water, aqueous solutions of salts, brine, aqueous solutions of food acids, vinegar, aqueous solutions of sugars, aqueous solutions of other sweetening substances, fruit or vegetable juices.

2.5 CAPACITY OF CONTAINER

The capacity of the container corresponds to the volume of distilled water at 20° C that the container holds when completely filled and sealed. For non-metallic rigid containers, such as glass jars, the drained weight of a product is calculated on the basis of the weight of distilled water at 20° C that the container holds when completely full, less 20 ml.

2.6 INSPECTION LOT (also called a **batch)**

Definite quantity of prepackages produced at one time under conditions that are presumed to be uniform and from which a sample is drawn and inspected to determine conformance with specified criteria for acceptance or rejection of the inspection lot as a whole.

The batch comprises the prepackages of the same nominal quantity, the same type and the same production run, packed in the same place, which are to be inspected. The batch size shall be limited to the amounts laid down below.

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[1] Throughout the document the term “weight” is used instead of “mass” as the terms “net weight” and “drained weight” are recognized internationally, although not corresponding to the terms that should normally be used in a scientific context.

- When prepackages are checked at the end of the packing line, the number in each batch is equal to the maximum hourly output of the packing line, without any restriction as to batch size.
- For lots of more than 10,000 items, the lot is divided so that each segment has at least 100 and not more than 10,000 items. In this case, a lot is accepted if each of the segments is accepted by the inspection.
- For lots that have fewer than 100 items, the statistical control by sampling envisaged for lots of at least 100 to at most 10,000 items is not appropriate.

2.7 SAMPLE SIZE

Pre-packages taken from en inspection lot and used to provided information that will serve as the basis for a decision on the conformance of the inspection size.

Note: The symbol *n* means sample size.

2.8 NEGATIV ERROR AND TOLERABLE NEGATIVE ERROR (TNE)

2.8.1 Negative error

The negative error of a pre-package is the quantity by which the actual weight of the pre-package are less than the nominal weight.

2.8.2 Tolerable negative error (E)

The tolerable negative error in the nominal drained weight of a pre-package is fixed in accordance with the table below.

2.8.3 Defective prepackages

Individual prepackages having a negative error of the actual drained weight greater than the tolerable negative error laid down in Table 1 below, will be defined as defectives.

2.8.4 Non acceptable prepackages

Individual prepackages having a negative error of the actual drained weight greater than twice the tolerable negative error laid in Table 1 will be defined as non acceptable or inadequate.

Table 1: Tolerable negative errors of the drained weight (E)

Nominal drained weight in g	**Tolerable negative errors of the drained weight**	
	Percentage of Qn	**g**
0 to 50	9	-
50 to 100	-	4.5
100 to 200	4.5	-
200 to 300	-	9
300 to 500	3	-
500 to 1,000	-	15
1,000 to 10,000	1.5	-
10,000 to 15,000	-	150
Up to 15,000	1	-

For application of these tables, the values calculated in units of mass of tolerable negative errors indicated in percentages should be rounded up to the nearest tenth of gram.

3. METROLOGICAL REQUIREMENTS FOR A PRE-PACKAGE

A pre-package shall meet the requirements below at any level of distribution including at the point-of-pack, import, distribution and wholesale transactions, and sale (e.g. where a pre-package is offered or exposed for sale or sold).

3.1 AVERAGE REQUIREMENT

The actual drained weight in a batch shall not be less, on average, than the nominal drained weight.

3.2 MINIMUM ACCEPTABLE QUANTITY REQUIREMENTS

The actual quantity of product in a pre-package shall accurately reflect the nominal quantity but reasonable deviations shall be allowed.

An inspection lot shall be rejected if it contains:

- More defective prepackages than allowed in the test plan.
- One or more non acceptable or inadequate pre-package.

4. TESTING PLAN (DESTRUCTIVE TEST) ANNEX 1

5. PROCEDURE FOR DETERMINATION OF DRAINED WEIGHT

5.1 LOCATION OF SAMPLING AND TESTING

Sampling and testing of a batch shall preferably be performed at the packer's premises. If this is not possible then, for imported products, sampling may be performed at the location of import.

5.2 CONDITIONS FOR TESTING

Sampling can be performed anytime.

However the test shall be performed when, according to the manufacturer, the product is ready to be consumed.

Sampling should therefore take place after such equilibrium has been attained, in other words at least 14 days after sterilization, pasteurization or any similar process, or when the operator considers the products ready for market.

The recommended period of time for checking the net drained weight of the specific products as examples are as follows[2]:

Table 2: Recommended periods of time for checking drained weight

Product	Time interval before control	
	FROM	TO
Fruits, vegetables and other vegetable foodstuffs (except strawberries, raspberries, blackberries, kiwi and loganberries)	30 days after sterilization	Shelf life
Strawberries, raspberries, blackberries, kiwi fruit, loganberries	30 days after sterilization	2 years after sterilization

5.3 APPARATUS

For draining the product from a pre-package, use a flat sieve with a square mesh of 2.5 mm (wire thickness 1.12 mm). The diameter of this sieve should be 20 cm for use with prepackages of 850 mL or less, and 30 cm for use with containers over 850 mL. If the nominal quantity is 2.5 kg or more, the quantity may, after weighing the whole amount, be divided among several sieves.

5.4 DETERMINING THE ACTUAL QUANTITY OF PRODUCT OF A SAMPLE

1) Determine the sieve's weight.
2) Open the pre-package and pour the product and liquid medium across the sieve. Distribute the product and liquid medium over the surface of the sieve but do not shake the material on the sieve. Tilt the sieve to an angle of 17° to 20° from the horizontal to facilitate draining. Carefully invert by hand all solid product, or parts thereof, whiff have hollows or cavities if they fall on the sieve with the hollows or cavities in soft products (e.g. sliced fruit) by tilting the sieve. Allow a 2 minute drain time.
3) Reweigh the sieve plus contents and calculate the drained quantity as follows:

   P = P2 – P1

   Where:

   P = drained quantity of the product

   P1 = weight of the clean sieve

   P2 = weight of the sieve plus product after draining

   Note: A subsequent weighing of the same sieve should ensure that it is clean and free of product debris. The sieve does not have to be dry as long as it is weighed accurately before being used.

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2 The time intervals are recommended by the OIML and the WELMEC working group.

ANNEX 1

TESTING PLAN FOR CONTROLLING DRAINED WEIGHT OF CANNED FRUITS AND VEGETABLES IN PACKING MEDIA

Inspection LOT (BATCH)

Prepackages uniform of the same nominal quantity: QN ≥ 5 g from the same lot

Lot size: 100 to 10,000 pre-packages

DESTRUCTIVE CHECK

SAMPLING

20 pre-packages drawn at random from the batch (n)

WEIGHING OF PRE-PACKAGES

→ Weigh the sieve empty = P1
→ Pour the content of the pre-package on the sieve
→ drain during 2 minutes to an angle of 20°, invert all products with cavities
→ weigh the sieve plus product after draining = P2
→ Drained weight = P2 – P1

AVERAGE TEST

Check of the drained weight		
lot ≥ 100		
n	acceptance	rejection
20	$\bar{x}_2 \geq QN_{drained} - 0.64\ s_2$	$\bar{x}_2 < QN_{drained} - 0.64\ s_2$
$\bar{x}_2$ = average of the drained weights of the samples		
s_2 = estimated standard deviation of the actual drained weights of the batch $QN_{drained}$ = nominal drained weight		

DECISION OF THE AVERAGE TEST

Acceptance or rejection

DEFECTIVE TEST

Check of the drained weight		
lot ≥ 100		
n	acceptance	rejection
20	1	2
Rejection if the drained weight < $QN_{drained}$ - E		
E = tolerance negative error depending of $QN_{drained}$		
(Rounded up to the nearest tenth of gram)		

TABLE 1

NOMINAL DRAINED WEIGHT « QN » **(grams)**	**TOLERABLE NEGATIVE ERROR « E » (grams)**	
	Percentage of « QN »	**By grams**
5 to 50	9	
50 to 100		4.5
100 to 200	4.5	
200 to 300		9
300 to 500	3	
500 to 1,000		15
1,000 to 10,000	1.5	
10,000 to 15,000		150
Up to 15,000	1	

DECISION for the DEFECTIVE TEST

Acceptance or rejection

NON ACCEPTABLE PREPACKAGES

Prepackages having a negative error of the actual drained weight greater than twice the tolerable negative error laid in Table 1

DECISION for non acceptable prepackages

The batch is rejected if it contains one or more non acceptable pre-package

FINAL DECISION

The batch is accepted if it complains to the 3 tests

ANNEX 2
INSPECTION CARD FOR OFFICIAL INSPECTION

Date	Random Package report			Report number
Location (name, address)		Product Identity	Manufacturer	Container Description
		Lot number		
1. Nominal Weight Nominal drained net weight	2. Unit of Measure *grammes*	3. TNE[1] = … *g*	4. Inspection lot size	5. Sample size

6. Defective unit: if weight < Qn – TNE ….*g*	7. Number of defective units allowed	8. Non acceptable unit if weight < Qn –2 TNE … *g*	9. Number of non acceptable units allowed

10. Clean sieve weight P1 =.

11. Open the pre-package and pour the product liquid medium across the sieve – drain during 2 minutes to an angle of 20°, invert all products with cavities

12. Determine the weight of the sieve plus product after draining = P2

P2 net weight	Net drained weight P = P2 – P1		P2 net weight	Net drained weight P = P2 – P1
1.			11.	
2.			12.	
3.			13.	
4.			14.	
5.			15.	
6.			16.	
7.			17.	
8.			18.	
9.			19.	
10.			20.	

13. Calculate the mean $\bar{x}$ =... *g*	14. Calculate the standard deviation s = … *g*	15. Calculate Qn – 0.64 s = ...

16. If $\bar{x}$ < Qn – 0.64 s, then the batch is rejected

☐ rejected ☐ OK for this test

17. Count the number of defective units = ...

18. If number of defective units ≥ 2, then the batch is rejected

☐ rejected ☐ OK for this test

19. Count the number of non acceptable units =.

20. If number of non acceptable units ≥ 1, then the batch is rejected

☐ rejected ☐ OK for this test

[1] TNE = Tolerable Negative Error.

21. Disposition of inspection lot: if □ approved □ rejected	
Comments The lot is accepted / rejected for the 3 tests	Official's signature
	Acknowledgement of report

ANNEX 3

INSPECTION CARD FOR OFFICIAL INSPECTION – EXAMPLE OF TEST

Date **MARCH 15, 2011**	Random Package report			Report number *23*
Location (name, address) *Ol Market,* *Vaugirard Ave* *Paris, 75007*		Product Identity *peas* Lot number *1 22 128*	Manufacturer **OL MARKETD**	Container Description *2 containers*
1. Nominal Weight *400* Nominal drained net weight *280*	2. Unit of Measure *grammes*	3. TNE[1] = *9 g*	4. Inspection lot size = *8,500*	5. Sample size = 20
6. Defective unit if weight < Qn – TNE *271 g*		7. Number of defective units allowed =1	8. Non acceptable unit if weight < Qn –2TNE *262 g*	9. Number of non acceptable units allowed = 0

10. Clean sieve weight P1 = *200*

11. Open the pre-package and pour the product liquid medium across the sieve – drain during 2 minutes to an angle of 20°, invert all products with cavities

12. Determine the weight of the sieve plus product after draining = P2

P2 net weight	Net drained weight P = P2 – P1		P2 net weight	Net drained weight P = P2 – P1
1. 478	*278*		11. *483*	*283*
2. 476	*276*		12. *481*	*282*
3. 479	*279*		13. *486*	*286*
4. 481	*281*		14. *480*	*280*
5. 485	*285*		15. *483*	*283*
6. *483*	*283*		16. *475*	*275*
7. *481*	*281*		17. *480*	*280*
8. *480*	*280*		18. *481*	*281*
9. *470*	*270*		19. *487*	*287*
10. *474*	*274*		20. *472*	*272*

13. Calculate the mean $\bar{x}$ = *279.8 g*	14. Calculate the standard deviation s = *4.52 g*	15. Calculate Qn – 0.64 s = *277.10*

16. If $\bar{x}$ < Qn - 0,64 s, then the batch is rejected

☐ rejected ■ OK for this test

17. Count the number of defective units = *1*

18. If number of defective units ≥ 2, then the batch is rejected

☐ rejected ■ OK for this test

19. Count the number of non acceptable units = *0*

[1] TNE = Tolerable Negative Error.

20. If number of non acceptable units ≥ 1, then the batch is rejected □ rejected ■ OK for this test	
21. Disposition of inspection lot: if ■ approved □rejected	
Comments The lot is accepted for the 3 tests	Official's signature Acknowledgement of report

Appendix II

GENERAL GUIDANCE FOR THE PROVISION OF COMMENTS

In order to facilitate the compilation and prepare a more useful comments' document, Members and Observers, which are not yet doing so, are requested to provide their comments under the following headings:

(i) General Comments

(ii) Specific Comments

Specific comments should include a reference to the relevant section and/or paragraph of the document that the comments refer to.

When changes are proposed to specific paragraphs, Members and Observers are requested to provide their proposal for amendments accompanied by the related rationale. New texts should be presented in underlined/**bold** font and deletion in ~~strikethrough font~~.

In order to facilitate the work of the Secretariats to compile comments, Members and Observers are requested to refrain from using colour font/shading as documents are printed in black and white and from using track change mode, which might be lost when comments are copied/pasted into a consolidated document.

In order to reduce the translation work and save paper, Members and Observers are requested not to reproduce the complete document but only those parts of the texts for which any change and/or amendments is proposed.