

Conference on "Risk Assessment and Ranking of Risks in European Food Safety Systems"

National Food Sampling Plan: risk-based and random

28th november









(Plano Nacional de Colheita de Amostras - PNCA)

Objective:

✓ Warrant that the <u>Food</u> in the market is SAFE

 \checkmark Safeguard the interests of consumers

LabellingFraudulent practices





(Plano Nacional de Colheita de Amostras - PNCA)



National Food Sampling Plan

(Plano Nacional de Colheita de Amostras - PNCA)

Risk-based Sampling

| | | Severidade | | | | | | |
|---------------------|-------------------|---------------|--------------|-----------------|-------------|-------------------|--|--|
| | | Mínima (1) | Baixo (2) | Moderada (3) | Alta (4) | Muito Alta (5) | | |
| Nível Ocorrência | Muito Alta (5) | Baixo | Moderado | Alto | Alto | Muito Alto | | |
| | Alta (4) | Baixo | Moderado | Moderado | Alto | Alto | | |
| | Moderado (3) | Baixo | Moderado | Moderado | Alto | Alto | | |
| | Baixo (2) | Baixo | Baixo | Moderado | Moderado | Alto | | |
| | Mínima (1) | Muito Baixo | Baixo | Baixo | Moderado | Alto | | |

RISK MATRIX

Ranks food groups in relation to the risk on a qualitative scale

(RPN – Risk Priority Number)



G = Severity Index or Degree of Risk of identified hazards associated with foodstuffs;

O = Occurrence Index of the previous year;

D = Detection Index or probability of detecting the hazard.

(Plano Nacional de Colheita de Amostras - PNCA)

Risk-based Exposure

| Group | NPR | (2NPR+C)/3 | Proportion | Anual sampling n'i 2024 |
|---|------|------------|------------|-------------------------|
| Meat and processed meat | 320 | 407 | 0,147 | 221 |
| Fishery Products | 320 | 288 | 0,104 | 156 |
| Dried fruit | 280 | 200 | 0,072 | 109 |
| Dairy products | 240 | 378 | 0,137 | 205 |
| Cereals and all products derived from cereals | 200 | 404 | 0,146 | 219 |
| Fruit and vegetables | 168 | 570 | 0,206 | 309 |
| Non-alcoholic beverages | 100 | 311 | 0,112 | 169 |
| Ready-to-eat foods | 40 | 41 | 0,015 | 22 |
| Spices, condiments and sauces | 40 | 46 | 0,016 | 25 |
| Oil and fat | 32 | 39 | 0,014 | 21 |
| Sweets and honey | 32 | 39 | 0,014 | 21 |
| Eggs and Egg products | 24 | 19 | 0,007 | 11 |
| Alcoholic beverages | 24 | 23 | 0,008 | 13 |
| | 1820 | 2765 | 1,000 | 1500 |

(Plano Nacional de Colheita de Amostras - PNCA)

Risk-based Programming



Random

National Food Sampling Plan

(Plano Nacional de Colheita de Amostras - PNCA)



ACESS – launching the quarterly distribution of samples/determinations

| Base Criar Dados Externos | Fei | amentas d | la Dace de Dad | os Campos | Tabela | | | | | | | | | | | |
|---|------|------------|----------------|------------------------------|------------------------------|-------------------------|-----------------------------------|------------------|-------------|-----------------|--------------|-----------------|---------------|-------------------|-----------------|------------------|
| All & Cortar 🔍 | 7 11 | Accenter | te 🦻 | Selecção + | | 🛁 Novo 🛛 🏛 Totais | A fi suotha | Gibi | | 11 | and and an | | | | | |
| Ra Croixe | 1. | Descender | ete 👔 | Avenuedas - | 1.00 | 🚽 Guester 🛛 🚏 Ortogenta | a the state of the factor | | | | | | | | | |
| 🕼 Pincel de Formatação | - 12 | Renover G | indenação 🖓 | Activa Desactivar F | itro Tudo * | 🗙 Bininar + 🔚 Mais + 👘 | Seleccion | - N 2 8 | 4.2 | | - 88-1- | | | | | |
| licea de Transferência 🦷 🖓 | | | Ordenare Filt | 37 | | Registra | Localizar | | Form | stacio de Testo | | | | | | |
| ajectos do Access 🛛 🛞 👳 | 100 | sla, Grapo | | | | | | | | | | | | | | |
| مر | | Cod | _Grupo | | Lista (| de Grupo | Citcor pero A | dicionar + | | | | | | | | |
| 2 | 8 | 11 | | Grupo de car | mes | | | | _ | | | | | | | |
| e Lab Gen | 111 | Coc | i_Sitenpi+ | | Lista Subgru | 50 · 0 | lear pasa / + | | | | | | | | | |
| terminações | | × 010 | 1 | Carne fresca | | | | | | | | | | | | |
| n ika Drt 052018 final | | 010 | 12 | Carno picada | | | | | | | | | | | | |
| | | | ID | CodGrupe | CodGen_a | hi e | | Gerero alme | enticio | | | | mestre + 2_1n | nestre + 3_fimest | e · 4_trimestre | Clearpara / |
| nui jannina jassa jim | | | | / 01 | 010301 | Carne pitada | | | | | | | 4 | | | 5 |
| spo | | | 1 | 8 01 | 060202 | Carne picada obtida | a a partir de outras car | nes, destinada a | ser consum | ida cosinhada | | | 6 | 6 | 5 | 5 |
| ogrupo | | | 10 | 1.0 | - 000_d | eterr - Usta_Det | jerminação - C | Det_1_Trimestre | - Det 2.1 | im - Det_3_Iri | in • Det_4_1 | rim - Charpora | 7.4 - | | | |
| 2 | | | | 12 | 12 M02 | Salmonella 10g | | | 6 | 0 | 5 | 5 | | | | |
| | | | | (Nova) | | | | | | | | | | | | |
| (Lienolis, Analisa | | | 8 | 9 01 | 060203 | Carne picada de ave | es de capoeira | | | | | | 6 | 6 | 6 | 5 |
| 1 Semestre Deetrninoções | | | (1) | (0V0) | | | | | | | | | | | | |
| ta American mena Determinar | | . 010 | 15 | Preparados de | came | | | | | | | | | | | |
| La constanta da la constante | | * 010 | И | Producos a bas | e de came | | | | | | | | | | | |
| all all and a second second second second | | • | | | | | | | | | | | | | | |
| ajprogramaçãojtrim_determina | E E | 12 | | Grupo de pe | \$6200 | | | | | | | | | | | |
| rapo, Saborapo, Geneco | | CCC | Stogrup: | | Usta Subgru | | icer para x - | | | | | | | | | |
| ógrepoj lábolaj programação | | + 020 | | Pescado mesco | 1 | | | | | | | | | | | |
| | | A 0.40 | <i>u</i> | Pescado tranco | ormado (conse | rvas; bacamas j | | | | | | | | | | |
| | | * 020 | 13 | Crustaceos | | | | | | | | | | | | |
| | | 2 0/0 | 1 | MOLLADA DAVE | tes, malayars | tereschoraez e Securit | | | | | | | | | | |
| | | | 0 | Costerade | • couden a | | | derere arme | 31000 | | | 1 4,00 | mesore + 2 m | inside s innesi | ev + onnesoe | - Citar para x + |
| | | | (| 52.02 | 020401 | MOUSCOS DIV2MES | vivos e equincoermes | tunicatos e ga | stropenes v | Nes | Doi: 10 | dia anti- | 14 | 4 | 16 | 12 |
| | | | | | 1000_0 | eten - Usta_Det | eurosteo - r | ACC Innesite | - DECCU | m - pecitin | m x DeCCI | rim - Crearpord | 12.4 | | | |
| | | | | 50 | 54 M03 | Salmovella | | | | 30 | 18 | | | | | |
| | | | | 22 | 30 MU3 | E. CON | | | 3 | 20 | 10 | | | | | |
| | | | | 20 | 50 007 | Crumeo | | | | 2 | | 4 | | | | |
| | | | | 57 | 57 Q0a | Cadmio | | | 3 | 5 | | 4 | | | | |
| | | | | 28 | 58 GLV | wercurio | | | | 2 | | | | | | |
| | | | | (NOVO) | | | | | | | | | | | | |
| | | | | 36 07 | 0.454827 | MORINES Divisiones | congeners/transform | naces | | | | | 1 | 7 | | 2 |
| | | | 71 | 57 02 | 020405 | Cetalopodes (sem v | viscerasj | | la des | | | | 2 | 2 | | 5 |
| | | | | 36 02 | NINA | Centropodes craide | is our mesons, congetat | tove unisconge | GODS . | | | | | | | |
| | | | | 59 92 | 020405 | moiuscos e cetalóp | odes mescos, congela | oos e utracongo | 12005 | | | | | | | |
| | | | | 80 02 | 059409 | Moluscos bivatres | (umados) | | | | | | | | | |
| | | * | (5 | iovoj | | | | | | | | | | | | |



Launch of the Operations Order: Sample Collection



(Plano Nacional de Colheita de Amostras - PNCA)

Risk-based goals of the activity

The purpose is to **minimize risk to consumer health**



- <u>Risk considerations</u> have an influence on:
- The sample size for the different food subgroups
- Analytical scope

The intention is:

- ✓ Increase the control of High-Risk Food Groups: with more noncompliance + more severe violations + more consumed;
- Non compliances trigger risk management measures
 => reduce the rate of non-compliance of products on the market and thus increase consumer safety

(Plano Nacional de Colheita de Amostras - PNCA)



Representative goals of the activity

- Within a food subgroup and for a fixed analytical determination, the selection of the units (places where samples are taken + commodities themselves) is random.
- Samples must be taken in the entire country (all districts)
 - ✓ Generate a population estimate of NC rates of food groups on the market + analyze trends over the years.
 - Produce an overall violation rate and analyze trends over the years;
 - ✓ Results are used in risk assessment, exposure assessment and to evaluate/identify high risk groups for the following year's plan (use previous 5-6 years' results).

(Plano Nacional de Colheita de Amostras - PNCA)

Situation

- Total fixed sample size (1500 for monitoring of risk exposure)
- 13 food groups with 52 subgroups
- Risk-based allocation of overall sample size to food groups using a mixed weighting scheme including
 - risk priority number
 - > consumption
- (Near) random sampling within groups
- Equal spread over districts assumed

How representative is the plan given the number of samples available per year?

Is the overall sample size enough?

What is a lower bound that must not be exceeded (red line)?

Questions

Economic and Food Safety Authority

2

(Plano Nacional de Colheita de Amostras - PNCA)

- ✓ Calculate sample size using risk-based allocation
- ✓ For every (sub-) group compute precision/power/error margin etc. that can be achieved given the sample size
- ✓ Check if acceptable



Formula to calculate the sample size and accuracy of proportion estimates: <u>calculate the sample size / width of confidence interval (CI)</u>.

| A | В | C | | A | В | С | D |
|------------------------------------|-------------------------|--|----|---|--|--|---|
| 1 Sample s | ize for given co | onfidence level and CI width | 1 | CI width for giv | en sample | size and confidence level | |
| 2 | | | 2 | | | | |
| 3 Expected prop | ortion 5,25% | | 3 | Expected proportion | 5,25% | | |
| 4 Width of CI | 10,00% | | 4 | Confidence level | 95% | | |
| 5 Confidence leve | el 95% | | 5 | Sample size | 94 | | |
| 6 | | | 6 | | | | |
| 7 Sample size | 277 | | 7 | Width of CI | 9,02% | | |
| 8 | | | 8 | | | | |
| 9 | | | 9 | | | | |
| 10 | | | 10 | | | | |
| 11 Interpretation | | | 11 | Interpretation | | | |
| To estimate a t confidence leve | rue proportion, based o | n an expected proportion of 5,3%, with a 95% val width of 10%, you need a sample size of 77. | 12 | Given an expected prop 94, you will produce a p assuming the expected | ortion of 5,3%, a c roportion estimate proportion is accur | confidence level of 95%, and a sample size of with a confidence interval width of 9,02%, rate. | |
| 13 | | | 13 | | | | |
| | | | 14 | | | | |
| | | | 15 | | | | |



Sulfits in meat products

| | | Non-compliant | |
|------|---------|---------------|---------|
| Year | Samples | (NC) | NC rate |
| 2018 | 46 | 3 | 6,5% |
| 2019 | 67 | 9 | 13,4% |
| 2020 | 39 | 8 | 20,5% |
| 2021 | 69 | 1 | 1,4% |
| 2022 | 126 | 5 | 4,0% |
| 2023 | 87 | 2 | 2,3% |







How accurate is the estimate?

• Considering the non-compliance rate of 5.25%

What sample size would I need?

| | Confidence level | | | | | | |
|----------|------------------|------|------|--|--|--|--|
| width CI | 90% | 95% | 99% | | | | |
| 2% | 1346 | 1911 | 3301 | | | | |
| 5% | 216 | 306 | 529 | | | | |
| 10% | 54 | 77 | 133 | | | | |
| 20% | 14 | 20 | 34 | | | | |

What accuracy can I achieve?

| | | Confidence level | | | | | |
|------|---------|------------------|--------------|--------|--|--|--|
| Year | Samples | 90% | 95% | 99% | | | |
| 2018 | 46 | 10,82% | 12,89% | 16,94% | | | |
| 2019 | 67 | 8,96% | 11,80% | 14,04% | | | |
| 2020 | 39 | 11,75% | 14,00% | 18,40% | | | |
| 2021 | 69 | 8,83% | 10,53% | 13,83% | | | |
| 2022 | 126 | 6,54% | 7,79% | 10,24% | | | |
| 2023 | 87 | 7,87% | 9,37% | 12,32% | | | |







2020 to 2023 15% n=194



Risk-based vs Random Tool

Sample size for given confidence level and CI width

| Expected proportion | 15,00% | | |
|---|------------------------------------|---|--|
| Width of Cl | 10,00% | | |
| Confidence level | 95% | | |
| | | | |
| Sample size | 196 | | |
| | | | |
| | | | |
| | | | |
| Interpretation To estimate a true prop confidence level and a o 196. | ortion, based o confidence inte | n an expected proportion of 15%, with a 95% rval width of 10%, you need a sample size of | |
| | | | |
| | | | |





CONSUMER PROTECTION, PUBLIC HEALTH AND FAIR COMPETITION

