# FSANZ ANALYTICAL SURVEY OF ARSENIC, LEAD AND TIN IN SHELF-STABLE PEACH, PEAR AND APRICOT PRODUCTS

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In April 2015, FSANZ conducted a broad survey of the levels of arsenic, lead and tin in domestic and imported canned and shelf-stable fruit products available in Australia from supermarkets and through catering companies.

The survey was carried out in response to community concerns based on reported results of a study which showed the presence of arsenic in some canned peach products, and that some products had levels of lead and tin that did not comply with the *Australia New Zealand Food Standards Code* (the Code).

**SURVEY METHODOLOGY**

A total of 45 domestic and imported shelf-stable fruit products (peaches, pears and apricots) were collected from major supermarkets in Canberra or Melbourne, and from catering firms. These products represented a high proportion of available products on the market in this category. Sampling from all states and territories was not considered necessary as these foods are nationally available and not subject to regional variation.

Composite samples were prepared from three individual products, consistent with Australian Total Diet Study (ATDS) methodology. Samples were prepared to maintain the ratio of fruit and juice in the product in order to compare the levels of lead with the maximum level permitted (ML), calculated according to Standard 1.4.1 of the Code.

**METHOD OF ANALYSIS**

Determination of arsenic, lead and tin in shelf-stable fruits was conducted by the National Measurement Institute (NMI) using inductively coupled plasma-mass spectrometry (ICP-MS) and inductively coupled plasma optical emission spectrometry (ICP-OES) according to National Association of Testing Authorities (NATA) accredited methods. The limit of detection for arsenic, lead and tin was 0.005 mg/kg, and the limit of reporting was 0.01 mg/kg.

**ANALYTICAL RESULTS**

Analytical results for arsenic, lead and tin in the 45 domestic and imported shelf-stable peach, pear and apricot products are shown in Table 1.

* Total arsenic levels were below the limit of reporting in all 45 supermarket and catering shelf-stable peach, pear and apricot products
* Lead concentrations were below the calculated ML for mixed foods permitted in Standard 1.4.1 of the Code, in all peach, pear and apricot products tested
* Levels of tin were below the ML (250 mg/kg) in all peach, pear and apricot products tested.

**RELEVANCE OF RESULTS TO HEALTH RISK ASSESSMENT**

This study showed that levels of lead and tin in all domestic and imported products tested were below the maximum levels permitted in the Code. Arsenic was not detected in any product at reportable concentrations. Therefore, no compliance or public health and safety concerns were identified.

Results from the FSANZ survey are consistent with recent advice on surveillance testing conducted by the Department of Agriculture and Water Resources (the Department) for lead and tin in imported shelf-stable fruit at the border. The Department has advised FSANZ that all peach, pear and apricot products tested for lead and tin in 2015 have complied with the Food Standards Code.

**Table 1 Analytical results for arsenic, lead and tin in shelf-stable peach, pear and apricot products**

| **Product type** | **Product** | **Domestic / Imported** | **Arsenic****(mg/kg)** | **Lead****(mg/kg)** | **\*Calculated****Lead ML (mg/kg)** | **Tin****(mg/kg)** |
| --- | --- | --- | --- | --- | --- | --- |
| Peaches | Product 1 | Domestic | <0.01 | 0.054 | 0.065 | 22 |
| Product 2 | Domestic | <0.01 | <0.01 | 0.066 | 0.022 |
| Product 3 | Domestic | <0.01 | 0.036 | 0.063 | 140 |
| Product 4 | Domestic | <0.01 | <0.01 | 0.075 | <0.01 |
| Product 5 | Domestic | <0.01 | 0.03 | 0.066 | <0.01 |
| Product 6 | Imported | <0.01 | <0.01 | 0.061 | 50 |
| Product 7 | Imported | <0.01 | 0.027 | 0.067 | 59 |
| Product 8 | Domestic | <0.01 | 0.014 | 0.064 | 28 |
| Product 9 | Imported | <0.01 | 0.034 | 0.064 | 44 |
| Product 10 | Imported | <0.01 | 0.014 | 0.058 | 0.022 |
| Product 11 | Imported | <0.01 | 0.02 | 0.068 | 18 |
| Product 12 | Domestic | <0.01 | 0.014 | 0.059 | <0.01 |
| Product 13 | Imported | <0.01 | 0.022 | 0.060 | 0.12 |
| Product 14 | Imported | <0.01 | <0.01 | 0.065 | 50 |
| Product 15 | Imported | <0.01 | 0.035 | 0.065 | 52 |
| Product 16 | Imported | <0.01 | 0.015 | 0.064 | 37 |
| Pears | Product 17 | Domestic | <0.01 | 0.023 | 0.062 | 50 |
| Product 18 | Domestic | <0.01 | 0.03 | 0.063 | 57 |
| Product 19 | Domestic | <0.01 | 0.016 | 0.059 | 79 |
| Product 20 | Domestic | <0.01 | 0.051 | 0.058 | 0.059 |
| Product 21 | Domestic | <0.01 | <0.01 | 0.063 | 0.019 |
| Product 22 | Domestic | <0.01 | 0.036 | 0.062 | 42 |
| Product 23 | Domestic | <0.01 | 0.021 | 0.062 | 110 |
| Product 24 | Domestic | <0.01 | 0.046 | 0.063 | 47 |
| Product 25 | Imported | <0.01 | 0.016 | 0.063 | 47 |
| Product 26 | Domestic | <0.01 | 0.014 | 0.062 | 46 |
| Product 27 | Domestic | <0.01 | 0.042 | 0.065 | 46 |
| Product 28 | Imported | <0.01 | 0.016 | 0.062 | 78 |
| Product 29 | Imported | <0.01 | 0.011 | 0.061 | 64 |
| Product 30 | Domestic | <0.01 | 0.044 | 0.063 | 62 |
| Product 31 | Imported | <0.01 | <0.01 | 0.059 | 7.2 |
| Product 32 | Imported | <0.01 | 0.025 | 0.061 | 0.025 |
| Product 33 | Imported | <0.01 | 0.02 | 0.059 | 24 |
| Product 34 | Imported | <0.01 | 0.015 | 0.065 | 23 |
| Product 35 | Imported | <0.01 | 0.031 | 0.066 | 140 |
| Product 36 | Imported | <0.01 | <0.01 | 0.075 | 0.012 |
| Product 37 | Imported | <0.01 | 0.031 | 0.064 | 45 |
| Apricots | Product 38 | Domestic | <0.01 | 0.03 | 0.061 | 32 |
| Product 39 | Domestic | <0.01 | 0.013 | 0.062 | 0.024 |
| Product 40 | Domestic | <0.01 | <0.01 | 0.057 | 0.013 |
| Product 41 | Domestic | <0.01 | 0.01 | 0.063 | 81 |
| Product 42 | Domestic | <0.01 | 0.011 | 0.059 | 32 |
| Product 43 | Imported | <0.01 | <0.01 | 0.062 | 150 |
| Product 44 | Domestic | <0.01 | 0.012 | 0.056 | 68 |
| Product 45 | Imported | <0.01 | 0.054 | 0.067 | 73 |

* The limit of detection for arsenic, lead and tin was 0.005 mg/kg, and the limit of reporting was 0.01 mg/kg.
* The ML for tin in Standard 1.4.1 of the Food Standards Code is 250 mg/kg.
* \* The appropriate ML for lead in mixed foods such as canned peaches is calculated by assigning the proportion of each ingredient the appropriate ML; for example, the ML for lead in fruit is 0.1 mg/kg; the ML for juice or syrup is 0.01 mg/kg; the results are then summed to derive the relevant ML to apply for enforcement purposes. If canned peaches were assumed to be 80% fruit the relevant ML would be 0.082 mg/kg. No products exceeded the calculated ML for lead.