

Imported food risk statement Goji berries and agricultural chemicals

Commodity: Goji berries. Examples of this type of product include dried, fresh or frozen goji berries.

Analytes: Chlorpyrifos, cyhalothrin, cypermethrin, difenoconazole, triadimefon and propargite

Recommendation and rationale
<p>Is the detection of chlorpyrifos, cyhalothrin, cypermethrin, difenoconazole, triadimefon or propargite reported in goji berries a medium or high risk to public health:</p> <p> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <i>Uncertain, further scientific assessment required</i> </p> <p>Rationale:</p> <ul style="list-style-type: none"> Six different agricultural chemical residues have been detected in imported fresh, chilled, frozen or dried goji berries over the last 5 years These agricultural chemicals have intentionally been used as acaricides, insecticides or fungicides in the cultivation of goji berries There are currently no specific Maximum Residue Limits (MRLs) for goji berries listed in the Australia New Zealand Food Standards Code A dietary exposure risk assessment undertaken by FSANZ has concluded that none of the agricultural chemical residues detected in imported goji berries are likely to pose a public health and safety risk.

General description													
<p>Nature of the analyte:</p> <p>Six different agricultural chemical residues have been detected in fresh, chilled, frozen or dried goji berries imported into Australia over the last 5 years. These agricultural chemicals, namely chlorpyrifos, cyhalothrin, cypermethrin, difenoconazole, triadimefon and propargite are intentionally used as acaricides, insecticides or fungicides in the cultivation of goji berries.</p> <p>All six agricultural chemicals detected in imported goji berries are currently included in the Australia New Zealand Food Standards Code (the Code), with MRLs for some selected commodities.</p> <p>For each agricultural chemical, the highest goji berries residue reported are shown in the table below:</p>													
	<table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="padding: 5px;">Component (no of detections)</th> <th colspan="2" style="padding: 5px;">Highest residue (mg/kg)</th> </tr> <tr> <th style="padding: 5px;">Goji berries (not specified as dried)</th> <th style="padding: 5px;">Goji berries (dried)</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Chlorpyrifos (n=7)</td> <td style="text-align: center; padding: 5px;">0.04</td> <td style="text-align: center; padding: 5px;">0.28</td> </tr> <tr> <td style="padding: 5px;">Cyhalothrin (n=2)</td> <td style="text-align: center; padding: 5px;">0.082</td> <td style="text-align: center; padding: 5px;">No residue data</td> </tr> </tbody> </table>		Component (no of detections)	Highest residue (mg/kg)		Goji berries (not specified as dried)	Goji berries (dried)	Chlorpyrifos (n=7)	0.04	0.28	Cyhalothrin (n=2)	0.082	No residue data
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	Goji berries (not specified as dried)	Goji berries (dried)
Cypermethrin (n=2)	0.081	No residue data
Difenoconazole (n=2)	0.13	0.29
Triadimefon (n=2)	0.06	0.07
Propargite (n=2)	0.094	No residue data

Adverse health effects:

The Health based Guidance Values, i.e. Acceptable Daily Intake (ADI) and Acute Reference Dose (ARfD) for each agricultural chemical are shown in the table below:

Component	ADI# (mg/kg bw/day)	ARfD# (mg/kg bw)
Chlorpyrifos	0.003 (OCS)	0.1 (OCS)
Cyhalothrin	0.02 (OCS)	0.02 (OCS)
Cypermethrin	0.02 (JMPR)	0.04 (JMPR)
Difenoconazole	0.01 (OCS)	0.3 (OCS)
Triadimefon	0.03 (OCS)	0.08 (OCS)
Propargite	0.002 (OCS)	Not specified

Health Based Guidance Values established by OCS or JMPR.

Consumption patterns:

The Australian National Nutrition and Physical Activity Survey (2011-12 NNPAS) data was used to estimate the dietary exposures (ABS 2014). Goji berries were very infrequently consumed, with 22 people reporting consuming a goji berry product out of over 12,000 survey respondents. The reported goji berry products consumed were: goji berry, dried and goji berry, juice. Both the goji products (excluding those consumed as part of mixed foods such as breakfast cereals, smoothies, etc.¹) were only consumed by population aged above 19 years and thus consumption data was not available for children aged 2-6 years. For the population aged above 19 years, seven people reported consuming goji berry, dried and 15 people reported consuming goji berry, juice.

When a particular food or food group was not consumed in the survey, or there were not enough consumers for the particular age group to derive a 97.5th percentile amount to undertake an acute exposure assessment, food consumption data from similar foods were used. For example, food consumption data for all berry fruits were used to estimate the potential acute dietary exposure from consuming the goji berries; and dried fruits (except dried vine fruits) were used as a substitute for assessing the acute dietary exposure for goji berry, dried.

Chronic dietary exposure estimate

The estimated chronic dietary exposures to all the agricultural chemicals were calculated for respondents in the 2011-12 NNPAS and expressed as a percentage of the relevant health based guidance values, the Acceptable Daily Intake (ADI). The overall increase in chronic dietary exposures from all chemicals due to goji berry consumption is likely to be less than 1% of the ADI for each chemical, assuming the highest residue limits reported in the analysis. This slightly increased dietary exposure to these six agricultural chemical residues from goji berries in addition to that previously calculated from the total diet is unlikely to pose a public health and safety concern.

¹ This assessment does not include foods consumed as part of mixed foods as the recipe development for raw commodity foods is yet to be finalised for the 2011-12 NNPAS.

Acute dietary exposure assessment

For all the population groups assessed the estimated acute dietary exposures were well below the Acute Reference Dose (ARfD) for each chemical. Acute dietary exposure estimates for children aged 2-6 years from all berries varied between <1% and 7% of the relevant ARfD and for dried fruits (except vine fruits) it was between <1% and 3% of the relevant ARfD. For the population 2 years and above the estimated acute dietary exposures from all berries ranged between <1% and 3% of the relevant ARfD and between <1% and 32% of the relevant ARfD for the dried fruit (except vine fruits).

The actual acute dietary exposure from goji berries will likely be overestimated as consumption data for all berries or all dried fruit (except vine fruit) was used in these assessments rather than goji berries.

Key risk factors:

Not applicable

Risk mitigation:

In Australia, Standard 1.4.2 of the Code lists the maximum permissible limits for agricultural and veterinary chemical residues present in food. There are currently no specific Maximum Residue Limits (MRLs) for goji berries listed in the Code

The existing MRLs in the Code for berries for the six agricultural chemicals are shown in the table below:

Component	Existing MRLs for berries (mg/kg)	
	Fresh berries	Dried fruits
Chlorpyrifos	Black berries (0.5), Blueberries (*0.01), Cranberry (1.0), Strawberry (0.3)	Dried fruits (T 2.0)
Cyhalothrin	Berries and other small fruits (0.2)	Not included in the Code
Cypermethrin	Berries and other small fruits [except grapes] (0.5)	Not included in the Code
Difenoconazole	Not included in the Code	Not included in the Code
Triadimefon	Not included in the Code	Not included in the Code
Propargite	Strawberry (7.0)	Not included in the Code

* denotes that the MRL is set at or about the limit of determination; T Temporary MRL.

Compliance history:

There have been no specific notifications for goji berries on the European Commission's Rapid Alert System for Food and Feed (RASFF) during the period January 2007 – August 2015. For other berries, there has been one notification for propargite (0.075 mg/kg) in frozen mixed berries from Italy (with raw material from Poland, Serbia and Romania); seven notifications for propargite (0.02-0.38mg/kg) in strawberries from Egypt (below MRL in the Australian Code); and one notification for cypermethrin (1.31 mg/kg) and difenoconazole (1.1 mg/kg) in yumberries from China.

There have been no recalls for goji berries in Australia in the period January 2007 – August 2015.

Surveillance information:

Not applicable

Other relevant standards or guidelines

- Codex general principles of food hygiene *CAC/RCP 1 – 1969* follows the food chain from primary production through to final consumption, highlighting the key hygiene controls at each stage (Codex 2003a).
- Codex code of hygienic practice for fresh fruits and vegetables *CAC/RCP 53-2003* addresses Good Agricultural Practices and Good Manufacturing Practices that will help control microbial, chemical and physical hazards associated with all stages of the production of fresh fruits and vegetables from primary production to packing (Codex 2003b).

Approach by overseas countries

The US FDA have an import alert (#99-08) for detention without physical examination of processed foods for pesticides for goji berries from a number of specified producers if the product does not have a valid certificate of analysis showing the product does not contain illegal residues of the cited pesticides (pesticides include cypermethrin, propargite, cyhalothrin and triadimefon) (FDA 2015).

Other considerations

Conditions on the importation of goji berries (*Lycium barbarum*) can be found in the [ICON database](#).

This risk statement was compiled by FSANZ in: September 2015

References

ABS (2014) Australian health survey: Nutrition first results - Foods and nutrients, 2011-12. Australian Bureau of Statistics, Canberra.

<http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4364.0.55.007main+features22011-12>. Accessed 20 February 2015

Codex (2003a) General principles of food hygiene (CAC/RCP 1 - 1969). Codex Alimentarius Commission, Geneva

Codex (2003b) Code of hygienic practice for fresh fruits and vegetables (CAC/RCP 53 - 2003). Codex Alimentarius Commission, Geneva

FDA (2015) Import alert 99-08.

http://www.accessdata.fda.gov/cms_ia/importalert_259.html. Accessed 10 September 2015