



# Arsenic speciation

The toxicity or biological effect of an element largely depends on the chemical species present. For arsenic (As), the inorganic species arsenite and arsenate cause cancer and a range of adverse effects. This has resulted in regulation of the maximum levels of inorganic As that are permitted in rice and rice-based foodstuffs marketed in the EU.

Table 1 shows the maximum levels of inorganic As allowed in commodities currently identified as making major contributions to dietary intakes.

**Table 1:** Commission Regulation (EU) 2015/1006 of 25 June 2015 amending Regulation (EC) No 1881/2006 as regards maximum levels of inorganic arsenic in foodstuffs.

Foodstuffs		Maximum levels (mg/kg wet weight)
<b>3.5</b>	<b>Arsenic (inorganic)</b>	
<b>3.5.1</b>	Non-parboiled milled rice (polished or white rice)	0,20
<b>3.5.2</b>	Parboiled rice and husked rice	0,25
<b>3.5.3</b>	Rice waffles, rice wafers, rice crackers and rice cakes	0,30
<b>3.5.4</b>	Rice destined for the production of food for infants and young children	0,10

Many foodstuffs contain organically-bound As species. For example, most of the As in fish and shellfish is in the form of arsenobetaine that presents no health risk. Therefore measurements of total As concentrations do not always provide an adequate safety assessment. For this reason, ALS Scandinavia AB offers As speciation packages, and is accredited for measurements of inorganic As in foodstuffs according to European standard method EN 16802:2016.



In addition, non-accredited analyses of various waters, wastes, environmental solids, etc., can be provided. All packages on offer are shown in Table 2. These packages include two commonly-found As metabolites, monomethylarsonate (MMA) and dimethylarsinate (DMA) or cacodylate that can be readily determined together with inorganic As species.



# Arsenic speciation

**Table 2:** As speciation packages using HPLC-ICP-MS; standard turnaround time 5-10 working days, contact the laboratory for express delivery.

Parameter		Sample type			
		Foodstuff	Biota	Soil, sediment, waste, etc.	Fresh water
Limit of quantitation	As (III)	-	0,01 mg/kg	0,01 mg/kg	0,1 µg/l
	As (V)	-	0,01 mg/kg	0,01 mg/kg	0,1 µg/l
	Inorganic As	0,01 mg/kg	-	-	-
	DMA	0,01 mg/kg	0,01 mg/kg	0,01 mg/kg	0,1 µg/l
	MMA	0,02 mg/kg	0,02 mg/kg	0,02 mg/kg	0,2 µg/l
Accreditation?		Yes	No	No	No
Standard		EN 16802:2016	-	-	-

## Contact information

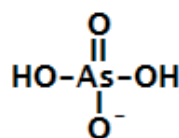
Douglas Baxter (douglas.baxter@alsglobal.com)

Lars-Gunnar Omberg (lars-gunnar.omberg@alsglobal.com)

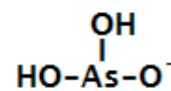
### ALS Scandinavia AB

Aurorum 10  
 SE-977 75 Luleå, Sweden  
 phone: +46 920 28 99 00  
 e-mail: info.lu@alsglobal.com  
 www.alsglobal.se

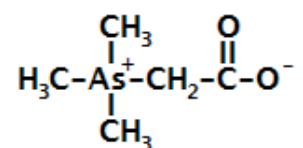
### Arsenate



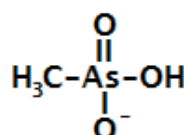
### Arsenite



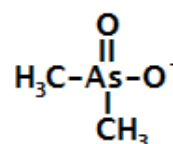
### Arsenobetaine



### MMA



### DMA



### ALS Scandinavia AB

Aurorum 10  
 SE-977 75 Luleå, Sweden

phone: +46 920 28 99 00  
 e-mail: info.lu@alsglobal.com

www.alsglobal.se