

## APPENDIX V

## RESPONSE FROM CCMAS TO THE REQUEST FROM CCFL47

In response to the request from CCFL47 to CCMAS (see [REP23/FL](#)) regarding suitable methods of analysis to support precautionary allergen labelling (PAL), CCMAS compiled methods in use by Codex Members for each priority allergen listed in Table 11 of Risk Assessment of Food Allergens Part 2: Review and Establish Threshold Levels in Foods for the Priority Allergens. These allergens include: wheat, cereals containing gluten (e.g. wheat) plus other gluten containing foods (Triticum species including rye and other Secale species, barley and other Hordeum species and their hybridized strains), crustacea, eggs, fish, milk, peanuts, sesame, and specific tree nuts (almond, cashew, hazelnut, pecan, pistachio, and walnut). No methods were submitted for pecan or pistachio but these could be reviewed again should CCFL require it. In addition to wheat, CCMAS agreed to include cereals containing gluten (e.g. other Triticum species, rye and other Secale species, barley and other Hordeum species and their hybridized strains). CCMAS additionally collated and categorized the method title, analysis principle, target analyte, conversion factors to mass of total protein from the allergenic food, LOQ or analytical measurement range, validation status, validation quality assurance, and method performance data from the validation study. In all, CCMAS collected over 100 sets of method validation data for evaluation against the following method development, validation, and performance guidelines (noting, the most recent guideline version must be utilized in each case):

- AOAC Appendix M
- EN 17855 (ELISA)
- EN 17644 (LC-MS)
- EN 17254 (ELISA Gluten)
- EN 15634 (PCR)

It is important to note that these AOAC and EN guidelines are not officially endorsed by Codex but serve as important reference against which to evaluate method performance and validation statuses. CCMAS informs CCFL that Codex members may also use these guidelines if they wish to evaluate method performance when implementing CCFL's work on PAL. CCMAS reviewed and agreed to include in its response to CCFL the methods contained in tTables 1 and 2 of this appendix. Table 1 includes methods that were either collaboratively studied or performance tested methods. These methods have shown acceptable performance on blinded food samples. Table 2 includes methods that were validated either at the manufacturer, in a single laboratory, or in-house.

The analytical methods in Tables 1 and 2 may be suitable for use in the process of conducting risk assessment for determining if UAP can be controlled below the specified action levels (ALs) for each allergenic food and supporting PAL. The AL will be dependent on the reference amount determined to be relevant in the risk assessment. However, food business operators must demonstrate that the selected method is fit for purpose for the specified AL and matrix in question. In addition, the following caveats apply:

- The tables reflect methods compiled by CCMAS that meet either the CEN performance requirements and/or the AOAC validation guidelines for at least one commodity—they are not exhaustive, and not all methods are able to measure across all foods at all specified ALs. Future methods will likely become available that can also meet the performance requirements.
- Currently, only a limited number of collaboratively studied and standardized test methods for allergen determination are available.
- The performance (accuracy, precision, recovery, etc.) of food allergen analytical methods is heavily dependent upon the food matrix and food production processing (e.g. exposure to high temperature, fermentation, etc.) and can lead to erroneous results. Consistent with FAO/WHO Risk Assessment of Food Allergens Part 2' Section 8.2 paragraph 1 the CCMAS tables 1 and 2 list methods using ELISA and LC MS/ MS, with a majority of ELISA methods because of their wider use and consequently the larger underlying evidence base, followed to a less extent LC-MS/MS. Although it is preferable for allergen test methods to target protein, in some instances where such test methodology is lacking, alternative methods, such as those based on DNA, may need to be used, nevertheless, conversion of DNA copies to total protein is a potential source of issues for these techniques and constitutes an indirect method for determining the presence of allergenic food.
- Food business operators must be aware that quantitative testing results produced by different test kits on the same test material may not necessarily agree. They are advised to select a test kit that has an appropriate sensitivity for the specified allergen in the selected food matrix and compiles with the performance requirements in AOAC Appendix M and/or EN 17855 (ELISA).

- With regard to whether the methods are suitable for assessing the risk of UAP in foods, the ALs in Table 11 of the [Risk Assessment of Food Allergens Part 2: Review and Establish Threshold Levels in Foods for the Priority Allergens](#) vary by approximately two orders of magnitude. The suitability of a method at the relevant AL is dependent on the amount of food consumed, reference amount (RfA), and the reference dose (RfD). Some methods included in Tables 1 and 2 are appropriate at certain RfAs but not others. The analytical range of a method (including dilutions as needed to quantify higher concentrations) must span the relevant AL before food business operators and/or trading partners begin testing. If there are instances where the level of UAP approaches the AL, then the precision and accuracy of the method at those concentrations should be understood.
- The LOQ of the method should be lower than the allergen AL because methods tend to not be as reliable at concentrations near the LOQ. A factor of 3 has been proposed to provide a safety margin (e.g. at an AL as low as 1 mg/kg, the method should have a LOQ of 0.33 or lower).
- The reporting units in many ELISA kits are not in the same units as the ALs. In many cases a conversion factor is required to convert the test reporting units into mg total protein from the allergenic food / kg food. CCMAS encountered inconsistent reporting of conversion factors. To avoid confusion and simplify interpretation against the ALs, analytical results should be reported in a standardized unit (mg total protein from the allergenic source / kg of food), but this is not always possible to include in a single table (e.g. for crustacean, tropomyosin conversion to total protein is heavily dependent on crustacean source and there is not a single conversion factor for all crustaceans). Food business operators and trading partners must ensure the test results are in the appropriate reporting units or use a valid conversion factor to calculate the correct reporting units.
- Methods for the determination of gluten in table 1 lack explicit association to the specific food sources of gluten (e.g. wheat, barley, rye, etc.). Methods that quantify gluten are aligned with the outputs of the recent FAO/WHO expert consultation on reference doses for gluten: <https://openknowledge.fao.org/handle/20.500.14283/cd7703en>.
- Laboratory users must review kit validation data for cross reactivities (e.g. for allergen analytical methods targeting walnut and cashew, a high degree of cross-reactivity with pecan and pistachio, respectively, has been reported, and depending on the assay kit, LOQ for pecan or pistachio may differ by approximately one order of magnitude from those for the intended target analytes). Users must also choose ELISA kits that will not produce false positives on the food matrix being tested. To facilitate this process, sample submitters must provide comprehensive sample product composition. Laboratory users should also note there are other factors in the samples under analysis which can cause false positives which are not related to cross reactivity (e.g. non-specific binding due to polyphenols, colors, etc.). The manufacturer-provided selectivity study is a resource but does not guarantee against cross reactivity.
- Some ELISA kits have critical changes since the time when validation studies were performed. For example, some manufacturers have changed extraction buffers to less hazardous reagents, and the associated performance of these kits may have changed. Since testing kits are updated on a regular basis, often maintaining the same kit name, it is difficult to relate the literature to the current iteration of the kit. Few kit manuals reference or publish the data relating directly to the development of that kit. If required, kit users can approach kit manufacturers and request whether further details and validation data are available to receive.<sup>3</sup> Users must ensure the method or ELISA kit chosen can meet the intended needs.
- Regarding validation, while collaborative studies estimate method performance in practice and independent laboratory studies (e.g. performance tested methods) can demonstrate how the method performs on an unknown in practice, these do not necessarily indicate that a method performs superiorly to methods that have only been validated by the manufacturer or validated in a single laboratory.
- Most proprietary methods are not distributed globally and the lack of availability of certain regions to access these methods would be restrictive to trade. Nevertheless, the provision of the information in this appendix may encourage broader supplier distribution.
- While the tables include methods that were submitted, multiple allergen testing kits with manufacturers' in-house validations are available from a range of suppliers and may also be appropriate, but this should be verified (see AOAC and EN guidelines reference above for guidance).
- Qualitative methods submitted to CCMAS were excluded from the tables of methods given the intended use.

CCMAS therefore encourages CCFL to consider these limitations with respect to the recommendations in

Tables 1 and 2 and to ensure that trading partners and users of the methods are aware of them. Users will need to review and if necessary, to verify method performance for their specific case and should consult the validation guidelines and performance requirements above. In addition to future methods likely becoming available, CCMAS emphasizes that there are many methods that were developed and validated before the AOAC guidelines and CEN performance requirements were published—the results of those methods are not invalidated, and users can obtain additional validation data where needed.

For CCFL's information, most of the methods submitted to the EWG rely on proprietary methods, typically in the form of Enzyme-Linked Immunosorbent Assay (ELISA) kits. The Codex Procedural Manual specifies that “a proprietary method should not be endorsed if a suitable non-proprietary method of analysis is available” and that “preference should be given to adopting appropriate method criteria rather than endorsing a specific proprietary method of analysis.”<sup>1</sup>

The submitted list of methods in tables 1 and 2 shall not be construed as a recommendation or an endorsement of food allergen methods. They are intended to facilitate CCFL's deliberations regarding reference doses and should not be forwarded by CCFL to CCMAS for endorsement nor included as a reference in CCFL's texts.

CCMAS can confirm that methods are available to detect and quantify unintended allergen presence (UAP) in foods from cross contact with detection and quantification limits (LOD and LOQ) suitable to determine if UAP is above or below the action levels established by the FAO/WHO Expert Consultation for priority allergens for intakes of foods from 10 g to 1000 g.

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<sup>1</sup> *Codex Procedural Manual*. 30<sup>th</sup> edition. Section 2.13: Provisions on the use of proprietary methods in Codex standards. Pg. 70.

<sup>3</sup> FSA-UK (2023) Review of allergen analytical testing methodologies: Allergen detection methods: Unbiased literature search , <https://www.food.gov.uk/research/review-of-allergen-analytical-testingmethodologies-allergen-detection-methods-unbiased-literature-search>

Table 1: Methods of analysis in support of precautionary allergen labeling with published, multi-laboratory validation studies or performance tested methods.

Allergen	Method	Principle	Catalog or website	Analytical Range / Limits (mg/kg)	Validation Citation
<b>Crustacea</b>	Shimadzu FA test EIA-crustacea II	ELISA	08624	0.31 – 20 mg crustacean protein/kg	J AOAC Int., 101(3), 798-804 (2018); J AOAC Int., 91, 123-129 (2008)
<b>Crustacea</b>	Crustacean kit II "Maruha Nichiro"	ELISA	55362	LOQ: 0.66 mg crustacean protein/kg (Catalog range 0.8 – 20 mg crustacean protein/kg)	J AOAC Int., 101, 798-804 (2018)
<b>Egg</b>	FASTKIT ELISA Ver.III EGG	ELISA	NPH-999100430EX	0.31 – 20 mg egg protein/kg	Food Safety 9.4 (2021): 101-116
<b>Egg</b>	Allergeneye ELISA II Egg Prima	ELISA	077834	1 – 20 mg egg protein/kg	Food Safety 9.4 (2021): 101-116
<b>Egg</b>	Morinaga BioSciences Egg (Ovalbumin) ELISA Kit II	ELISA	M2111	0.31 – 20 mg egg protein /kg	J AOAC Int., 89(6), 1600-1608 (2019); <a href="https://doi.org/10.1093/jaoac/89.6.1600">https://doi.org/10.1093/jaoac/89.6.1600</a>
<b>Gluten</b>	AOAC PTM 081202: ALLER-TEK® Gluten ELISA	ELISA	ELISA Technologies	LOQ: 5 mg gluten /kg	AOAC PTM 081202
<b>Gluten</b>	AOAC PTM 061201:Neogen Veratox® for Gliadin R5	ELISA	700002592	LOQ: 5 mg gluten /kg	AOAC PTM 061201
<b>Gluten</b>	AOAC PTM 052005: SENSISpec INgezim Gluten R5	ELISA	Gold Standard Diagnostics	LOQ: 3 – 4 mg gluten /kg	AOAC PTM 052005
<b>Gluten</b>	AOAC PTM 042301: GlutenTox ELISA Rapid G12	ELISA	Hygiena	LOQ: 1.2 mg gluten /kg	AOAC PTM 042301
<b>Gluten</b>	AOAC PTM 032301: TotalTarget Kit for Gluten	Immunochromatographic test	EnviroLogix	LOQ: 4 mg gluten /kg	AOAC PTM 032301
<b>Gluten</b>	AOAC PTM 011804: Wheat/Gluten ELISA Kit	ELISA	Morinaga BioSciences M2103	LOQ: 0.06 – 0.49 mg gluten /kg	AOAC PTM 011804

Allergen	Method	Principle	Catalog or website	Analytical Range / Limits (mg/kg)	Validation Citation
<b>Gluten</b>	AOAC 2018.15: RIDASCREEN® Total Gluten	ELISA	R-Biopharm R7041	LOQ: 5 mg gluten /kg	<a href="https://doi.org/10.1093/jaoac/102.5.1535">https://doi.org/10.1093/jaoac/102.5.1535</a>
<b>Gluten</b>	AOAC 2015.05: RIDASCREEN® Gliadin competitive	ELISA	R-Biopharm R7021	LOQ: 10 mg gluten /kg	<a href="https://doi.org/10.5740/jaoacint.CS2015.15">https://doi.org/10.5740/jaoacint.CS2015.15</a>
<b>Gluten</b>	AOAC 2014.03: AgraQuant Gluten G12 ELISA®	ELISA	Romer Labs	LOQ: 4 mg gluten /kg	<a href="https://doi.org/10.5740/jaoacint.14-197">https://doi.org/10.5740/jaoacint.14-197</a>
<b>Gluten</b>	AOAC 2012.01: RIDASCREEN® Gliadin	ELISA	R-Biopharm R7001	LOQ: 5 mg gluten /kg (2.5 mg gliadin /kg)	<a href="https://doi.org/10.1093/jaoacint/qsab148">https://doi.org/10.1093/jaoacint/qsab148</a>
<b>Gluten</b>	FASTKIT ELISA Ver.III WHEAT	ELISA	999100135	0.31 – 20 mg gluten /kg	Food Safety 9.4 (2021): 101-116
<b>Gluten</b>	Morinaga BioSciences Wheat/Gluten (Gliadin) ELISA Kit II	ELISA	M2114	0.31 – 20 mg wheat protein/kg, 0.26 – 17 mg gluten/kg	Food Safety 9.4 (2021): 101-116; AOAC PTM No.011804
<b>Gluten</b>	Allergeneye ELISA II Wheat	ELISA	077847	1 – 20 mg wheat protein/kg	Food Safety 9.4 (2021): 101-116
<b>Milk</b>	AOAC PTM 101501: RIDASCREEN® FAST Milk	ELISA	R-Biopharm R4652	LOQ: 2.5 mg milk protein/kg	AOAC PTM 101501
<b>Milk</b>	FASTKIT ELISA Ver.III MILK	ELISA	999100424	0.31 – 20 mg milk protein/kg	Food Safety 9.4 (2021): 101-116
<b>Milk</b>	Allergeneye ELISA II Milk Prima	ELISA	077836	1 – 20 mg milk protein/kg	Food Safety 9.4 (2021): 101-116
<b>Milk</b>	Morinaga BioSciences Total Milk ELISA Kit II	ELISA	M2122	0.31 – 20 mg milk protein/kg	Casein Protein ELISA Kit: J AOAC INT.VOL. 89, NO. 6, (2006)
<b>Peanut</b>	AOAC PTM 030403 Neogen Veratox for Peanut Allergen Test	ELISA	700002569	2.5 – 25 mg peanut /kg	AOAC PTM 030403
<b>Peanut</b>	AOAC PTM 112102: RIDASCREEN® Peanut	ELISA	R6811	Range: 0.166 – 1.33 mg peanut protein /kg	AOAC PTM 112102
<b>Peanut</b>	FASTKIT ELISA Ver.III PEANUT	ELISA	999100141	0.31 – 20 mg peanut protein/kg	Food Safety 9.4 (2021): 101-116

Allergen	Method	Principle	Catalog or website	Analytical Range / Limits (mg/kg)	Validation Citation
<b>Peanut</b>	Allergeneye ELISA II Peanut Prima	ELISA	077860	1 – 20 mg peanut protein /kg	Food Safety 9.4 (2021): 101-116
<b>Peanut</b>	Morinaga BioSciences Peanut ELISA Kit II	ELISA	M2116	0.31 – 20 mg peanut protein/kg	Food Safety 9.4 (2021): 101-116.

Table 2: Methods of analysis currently available in support of precautionary allergen labeling but lacking multi-laboratory validation studies.

Allergen	Method	Principle	Catalog or website	Analytical Range / Limits (mg/kg)	Validation Citation
<b>Almond</b>	RIDASCREEN® FAST Mandel/Almond (R609)	ELISA	R609	0.575 – 4.6 mg almond protein /kg	Manufacturer validation report not available
<b>Almond</b>	Neogen Veratox for Almond	ELISA	700002574	2 – 25 mg almond /kg	In-house manufacturer validation report available upon request
<b>Cashew</b>	RIDASCREEN® FAST Cashew R6872	ELISA	R6872	2.5 – 20 mg cashew /kg	Member reported in-house validation only
<b>Cashew</b>	BioFront Technologies - MonoTrace Cashew ELISA kit	ELISA	CA2-EK-96	LOQ = 1 mg cashew (whole) /kg, range = 1 – 40 mg cashew (whole) /kg; LOQ = 0.17 mg cashew protein, range 0.17 – 7 mg cashew protein/kg	Manufacturer validation report includes cake, cookies, chocolate, ice cream, powdered infant soy formula, yogurt, milk & spices.
<b>Cashew</b>	Neogen Veratox VIP for Cashew	ELISA	700002605	0.2 – 0.5 mg cashew protein / kg	In-house manufacturer validation report available upon request
<b>Cashew</b>	SENSISpec ELISA Cashew	ELISA	HU0030004	2 mg Cashew (whole) /kg	Manufacturer validation report for cookie, cornflakes, ice cream and dark chocolate.
<b>Crustacea</b>	Neogen Veratox for Crustacea Allergen	ELISA	700002598	2.5 – 25 mg total crustacea (shrimp)/kg	In-house manufacturer validation report available upon request

Allergen	Method	Principle	Catalog or website	Analytical Range / Limits (mg/kg)	Validation Citation
<b>Crustacea</b>	AgraQuant Crustacea ELISA test kit (10002076)	ELISA	10002076	LOQ is equivalent to 0.7 mg/kg of shrimp protein; 20 - 400 ppb tropomyosin, 0.1 - 2 mg crustacea protein / kg	Unpublished in-house validation only.
<b>Crustacea</b>	ELISA Systems Crustacean Tropomyosin Residue Assay	ELISA	ESCRURD-48	0.05 – 0.5 mg/kg Crustacean Tropomyosin	ELISA Systems Validation Report Crustacean Tropomyosin Oct 2020
<b>Egg</b>	AOAC 2017.17: Detection and Quantitation of Selected Food Allergens: LC-MS/MS	LC-MS/MS		LOQ: 3 mg whole egg powder/kg (1.44 mg total egg protein/kg food)	<a href="https://doi.org/10.5740/jaoacint.19-0112">https://doi.org/10.5740/jaoacint.19-0112</a>
<b>Egg</b>	RIDASCREEN FAST Ei/Egg	ELISA	R6402	0.24 mg/kg – 6.48 mg egg protein/kg	Manufacturer validation report Sept. 2017 available online
<b>Egg</b>	Romer Labs AgraQuant Egg White ELISA	ELISA	10002026	0.4 - 10 mg egg white protein/kg	Manufacturer validation
<b>Egg</b>	ELISA Systems Processed Egg Residue Detection Kit	ELISA	ESEGGPR-48	0.48 – 4.8 mg egg protein /kg	ELISA Systems Validation Report Processed Egg May 2021
<b>Egg</b>	RIDASCREEN FAST Lysozym	ELISA	R6452	0.25 mg/kg – 2.0 mg Lysozyme / kg – food; 0.05 mg/kg – 0.4 mg Lysozyme / kg – wine	r-Biopharm, RIDASCREEN FAST Lysozym Product Information 02/2016
<b>Egg</b>	Neogen Veratox for Egg Allergen	ELISA	700002575	2.5 – 25 mg/kg whole dried egg	In-house manufacturer validation report available upon request
<b>Fish</b>	GOLD STANDARD DIAGNOSTICS FISH ELISA	ELISA	FIS-E01/E04	LOQ: 4.0 mg/kg cod	Manufacturer validation



Allergen	Method	Principle	Catalog or website	Analytical Range / Limits (mg/kg)	Validation Citation
<b>Fish</b>	AgraQuant Fish ELISA test	ELISA	10002083	4 – 100 mg/kg cod	Manufacturer validation
<b>Gluten</b>	RIDASCREEN EASY Gluten	ELISA	RAE7071	3 – 48 mg gluten/kg	Manufacturer validation
<b>Hazelnut</b>	AOAC 2017.17: Detection and Quantitation of Selected Food Allergens: LC-MS/MS	LC-MS/MS		LOQ: 10 mg hazelnut/kg (1.503 mg hazelnut protein/kg food)	<a href="https://doi.org/10.5740/jaoacint.19-0112">https://doi.org/10.5740/jaoacint.19-0112</a>
<b>Hazelnut</b>	RIDASCREEN FAST Hazelnut	ELISA	R-Biopharm R6802	0.375 – 3.0 mg hazelnut protein/kg	Manufacturer validation
<b>Hazelnut</b>	RIDASCREEN EAS Hazelnut	ELISA	R-Biopharm RAE6401	0.3 – 5.4 mg hazelnut protein /kg	Manufacturer validation
<b>Hazelnut</b>	ELISA Systems Hazelnut Residue Detection Kit	ELISA	ESHRD-48	0.5 – 5.0 mg hazelnut protein/kg	ELISA Systems Validation Report Hazelnut December 2020 v2
<b>Hazelnut</b>	Hazelnut ELISA Kit II MloBS	ELISA	Morinaga BioSciences M2119	0.16 – 10 mg hazelnut protein / kg	Manufacturer validation
<b>Hazelnut</b>	Neogen Veratox for Hazelnut Allergen	ELISA	700002564	2.5 – 25 mg/kg hazelnut	In-house manufacturer validation report available upon request
<b>Milk</b>	AOAC 2017.17: Detection and Quantitation of Selected Food Allergens: LC-MS/MS	LC-MS/MS		LOQ: 10 mg fluid milk/kg (2.564 mg total milk protein/kg food)	<a href="https://doi.org/10.5740/jaoacint.19-0112">https://doi.org/10.5740/jaoacint.19-0112</a>
<b>Milk</b>	Neogen Veratox for total milk allergen	ELISA	700002577	2.5 – 25 mg/kg nonfat dried milk	Manufacturer validation



Allergen	Method	Principle	Catalog or website	Analytical Range / Limits (mg/kg)	Validation Citation
<b>Milk</b>	RIDASCREEN FAST $\beta$ -lactoglobulin	ELISA	R-Biopharm R4912	Range: 0.167 – 4.5 mg $\beta$ -lactoglobulin / kg (corresponding to 1.67-45 mg milk protein/kg)	Manufacturer validation
<b>Milk</b>	AgraQuant R MILK ELISA	ELISA	RomerLabs 10002080	Range: 0.4 mg/kg – 10 mg milk protein/kg , 2.0 – 50.0 mg milk protein /kg meat products	Manufacturer validation
<b>Milk</b>	AgraQuant Beta-Lactoglobulin ELISA	ELISA	RomerLabs 10002034	Range: 0.01 – 0.4 mg $\beta$ -lactoglobulin / kg	Manufacturer validation
<b>Milk</b>	ELISA Systems Casein Residue Detection Kit	ELISA	ESCASPRD-48	0.35 – 3.5 mg total milk protein/kg	ELISA Systems Validation Report Casein September 2024
<b>Milk</b>	RIDASCREEN FAST Casein	ELISA	R-Biopharm R4612	Unprocessed samples: 0.5 – 13.5 mg casein / kg (0.63 – 16.9 mg milk protein /kg) Processed samples: 2.5 – 67.5 mg casein / kg (3.13 – 84.4 mg milk protein /kg)	Manufacturer validation
<b>Milk</b>	ELISA Systems $\beta$ -Lactoglobulin (BLG) Detection Kit	ELISA	ESMRDBLG-48	1.0 – 10 mg total milk protein /kg	ELISA Systems Validation Report BLG Nov 2022
<b>Milk</b>	SENSIspec ELISA total milk protein	ELISA	HU0030014	0.4 – 10 mg milk protein / kg	Manufacturer validation

Allergen	Method	Principle	Catalog or website	Analytical Range / Limits (mg/kg)	Validation Citation
<b>Peanut</b>	AOAC 2017.17: Detection and Quantitation of Selected Food Allergens: LC-MS/MS	LC-MS/MS		LOQ:10 mg peanut/kg (2.22 mg total peanut protein/kg food) in cookies, 3 mg/kg (0.666 mg total peanut protein/mg food) in breakfast cereals	<a href="https://doi.org/10.5740/jaoacint.19-0112">https://doi.org/10.5740/jaoacint.19-0112</a>
<b>Peanut</b>	Morinaga BioSciences High Sensitive Peanut ELISA Kit II	ELISA	M2120	0.2 – 12.8 mg peanut protein/kg	Manufacturer validation
<b>Peanut</b>	Neogen Veratox VIP for Peanut	ELISA	700002570	0.25 – 5 mg peanut protein / kg	In-house manufacturer validation report available upon request
<b>Sesame</b>	Neogen Veratox for Sesame	ELISA	700002599	2.5 – 25 mg/kg sesame	In-house manufacturer validation report available upon request
<b>Sesame</b>	RIDASCREEN FAST SESAME	ELISA	R7202	0.53 – 4 mg sesame protein / kg	Manufacturer validation
<b>Sesame</b>	ELISA Systems Sesame Seed Protein Residue Assay	ELISA	ESSESE-48	0.25 – 2.5 mg/kg sesame seed protein	ELISA Systems Validation Report Sesame Dec 2022
<b>Walnut</b>	SENSISpec ELISA WALNUT	ELISA	HU0030024	LOQ 0.3 mg walnut protein/kg food; RANGE: 0.3 – 3.0 mg walnut protein/kg food	Gold Standard Diagnostic QP-19REP-99 Version 03EN
<b>Walnut</b>	BIOFRONT MONOTRACE WALNUT	ELISA	WJ4-EK-96	LOQ: 2 mg walnut / kg	Manufacturer validation

Allergen	Method	Principle	Catalog or website	Analytical Range / Limits (mg/kg)	Validation Citation
Walnut	AgraQuant R Walnut	ELISA	10002030	Range 2 – 60 mg walnut / kg	Manufacturer validation
Walnut	Neogen Veratox VIP for Walnut	ELISA	700002601	0.15 – 0.75 mg/kg walnut protein	In-house manufacturer validation report available upon request
Walnut	FASTKIT ELISA Ver.III WALNUT	ELISA	999500165	0.31 – 20 mg walnut protein/kg	
Walnut	FA test EIA-Walnut	ELISA	08637	0.31 – 20 mg walnut protein/kg	
Walnut	Morinaga BioSciences Walnut ELISA Kit II	ELISA	M2124	0.31 – 20 mg walnut protein/kg	
Walnut	RIDASCREEN Walnut	ELISA	R6601	0.16 – 2.84 mg walnut protein /kg	Manufacturer validation