# Aflatoxins B/G und Ochratoxin A in Tofu

## manual and automated

## Tofu

Tofu is made from white soybeans processed into soy milk. The soy curd produced by denaturing and coagulating proteins is dehydrated and then pressed into blocks. In cereals and legumes such as soybeans, mycotoxins can be produced by incorrect storage conditions and during the drying process. As these can be harmful to humans and animals, soybeans and their products are regularly tested for toxins. In the case of imports, EU border controls show that European limit values are not always complied with. For example, aflatoxin and ochratoxin A levels that are too high repeatedly lead to food being rejected.

Best sample purification
for food and feed

Immunoaffinity columns with
SMART-columns made by LCTech

### Immunoaffinity columns for aflatoxins B1, B2, G1 and G2

AflaCLEAN and OtaCLEAN are suitable for the analysis and clean-up of various matrices, whether feed or food, from A like amaranth to Z like cinnamon, all matrices can be analysed with reproducible results and highly sensitive to the mycotoxins aflatoxin B/G and/or ochratoxin A. Both the AflaCLEAN and the OtaCLEAN columns are suitable for manual and automated processing, e.g. with the LCTech FREESTYLE SPE robotic system. Simply place the two columns on top of each other and they are ready for the purification of aflatoxins B1, B2, G1, G2 and ochratoxin A.

*Advantages of the AflaCLEAN column at a glance:*

- 1 mL and 3 mL format for homogeneous running speed and optimal clean-up
- Outstanding shelf life up to 24 months at room temperature
- Loading capacity: 150 ng aflatoxin B1 (with OtaCLEAN even: 200 ng ochratoxin A)
- Recoveries: B1 > 90 %, B2 > 80 %, G1 > 90 %, G2 > 60 %
- Suitable for automated processing

## Processing protocol

Extract 20 g tofu with 2 g sodium chloride in 100 mL methanol/water (80/20 (v/v)) for 30 minutes. Add 50 mL n-hexane during the 30-minute extraction to extract fats and oils. Filter the crude extract, if there is no clear phase separation after filtration, centrifugation at 3000 xg for 10 minutes is helpful. Dilute 2 mL of the methanolic (lower) phase with 12 mL of PBS buffer containing 8 % Tween20, this reduces non-specific binding of matrix components to the IAC column. Load 14 mL onto an immunoaffinity column (AflaCLEAN, or OtaCLEAN), this corresponds to a matrix amount of 0.4 g. Rinse the sample introduction vessel with 5 mL deionised water and load the rinse solution onto the immunoaffinity column. The column is washed again with 5 mL deionised water. After the wash solution has passed through the column, the column is dried by a stream of air and eluted using 2 mL methanol. The methanol should be allowed to soak into the column bed for at least 5 minutes to allow complete denaturation of the antibodies and thus elution of the toxins. The eluate is diluted to runner ratios or injected in small volumes and analysed. The samples can thus be analysed by HPLC fluorescence or by LC-MS/MS.

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## Conclusion

Tofu, as a soy-based food, can also be contaminated by mycotoxins found in soy. Checking food for residues and contaminants using the immunoaffinity columns AflaCLEAN and OtaCLEAN allows the simple detection and purification of mycotoxins (aflatoxins B/G and ochratoxin A), which as storage fungi are significantly responsible for health damage.

Thus, food and feed can be assessed as safe and of high quality. Even processed and complex foodstuffs can be tested by means of the immunoaffinity columns AflaCLEAN and OtaCLEAN for mycotoxins.

The samples are compatible with HPLC fluorescence or LC-MS/MS analysis. High matrix depletion and concentration of the analytes ensure best results and sensitive analytics according to the strict limits set.

**These LCTech products were used:**

| | |
|---|---|
| 10514 | AflaCLEAN |
| 10515 | OtaCLEAN |
| 10519 | UVE |
| 10522 | HPLC column for mycotoxins |
| 10750 | Pre-column holder |
| 10523 | Pre-column (Guard) |

**Recovery rates** Aflatoxins**

| Aflatoxin | B1 | B2 | G1 | G2 |
|---|---|---|---|---|
| Standard* | 100 | 100 | 100 | 100 |
| Tofu AflaCLEAN 10 ppb | 93 | 82 | 103 | 98 |

**Recovery rates** Ochratoxin**

| | Ochratoxin A |
|---|---|
| Standard* | 100 |
| Tofu OtaCLEAN 10 ppb | 91 |

* Standard was set = 100% ,
** Corrected with non-spiked sample / The results are in accordance with the performance specifications of EC 401 / 2006 (section 4.3.1).

**Conditions**

| | Aflatoxins | Ochratoxin A |
|---|---|---|
| HPLC | Isocratic | Isocratic |
| Column oven | 36 °C | 40 °C |
| Separation column | RP C18 PN 10522 | RP EC 125/3 nucleosil 120-3 C18 |
| Flowrate, SolventI | 1.2 mL/min | 0.6 mL/min; HPLC-water/methanol/acetonitrile (40/55/5 (v/v/v)+1% acetic acid) |
| Derivati-sation | Photochemical by UVE | without derivatisation |
| Fluoresscence detection | | |
| Excitation wavelength | 365 nm | 335 nm |
| Emission wavelength | 460 nm | 465 nm |

Do you have a special request as to which matrix we should test for you?
Contact us by e-mail at: info@LCTech.de

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