

From waste to value: extraction of phytin from oilseed presscake

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Phytin, the calcium and magnesium salt of myo-inositol hexaphosphate, is a form of organic phosphorus widespread in vegetables and especially in their seeds [1]. The seeds of oil crops, such as sunflower and rapeseed/canola, are especially rich in phytin, which remains in the presscake after the extraction of oil. The presscake is also rich in proteins and other nutrients, and as such is commonly used as cattlefeed. However, the metal-chelating properties of phytin make it a potent antinutrient, requiring the cattlefeed to be supplemented with minerals.

Common procedures for phytin extraction involve the use of mineral acids, which affect the nutritional profile of the residue and could result in the generation of unwanted by-products.

A convenient, food-safe method to extract phytin from rapeseed presscake was developed, allowing the residue to be used as cattlefeed. The process makes use of an organic acid-based aqueous pH buffer to ensure a mild but fast extraction of phytin, which can then be precipitated as a solid by changing the solution pH, or further processed e.g. into phytic acid, which in turn can be used to produce high-added value products such as bio-based fire-retardants.

Phytin and phytic acid are not only valuable industrial products in the broad biorefinery concept, they prove their worth also for more fundamental applications in materials science.

[1] J. A. Maga, Journal of Agricultural and Food Chemistry, **1982**, *30*, 1–9.