

Maize germ cake

Problem

The protein supply to organic pigs and poultry requires careful management to ensure an adequate supply of essential amino acids and to avoid overfeeding. Alternative sources of protein need to be used to supply the balance of amino acids needed.

Solution

By-products of manufacturing processes are useful alternatives. Maize germ cake is a by-product of starch and corn oil production, as well as a brewing by-product.

Benefits

Maize germ cake contains higher levels of essential amino acids than whole maize, but less energy, which should help with rationing for slower growing breeds of pigs and poultry.

Applicability box

Theme

Arable crops - Crop production - Animal husbandry - Feed and nutrition - Feed processing and handling - Cereals - Forage - Nutritive values and needs - Ration planning

Geographical coverage

In all countries where maize is grown

Application time

Any time

Required time

No extra time required

Period of impact

Immediate Impact

Equipment

Existing feed equipment but good dry storage needed

Best in

All conditions

Practical Recommendations

- Maize germ cake is part of a group of loosely named by-products yielded from the wet milling and dry milling maize industries. It is important to know what process the cake is from because that will affect its feed value.
 - Dry milled maize should contain more soluble protein, starch, and phosphorus.
 - Wet-milled maize tends to contain more residual oil.
 - Organic cake will have high oil levels because oil can only be extracted by pressing, not solvents.
- Maize germ (about 11 % of the grain weight) cake contains 20-24 % crude protein and higher levels of essential amino acids than whole maize as shown in Table 1.

Table 1: Protein and amino acid levels in maize and maize germ meal

	Maize	Maize germ cake
Crude protein %	7.6	20
Lysine %	3.1	4.0
Methionine %	2.1	1.7
AMEn MJ/kg DM*	15.1	8.8

Source : Heuzé et al. 2015

*AMEn MJ/kg DM: Apparent metabolizable energy, nitrogen-corrected

- Other products like maize gluten feed are similar but contain more bran and have different nutritional values. Maize quality and processing methods should be identified well in advance to avoid any nutritional imbalances. Ideally, the feed should be analysed to determine nutritional value.
- The maize germ contains high levels of phytic acid which has some anti-nutritional factors, particularly relating to phosphorus availability, but up to 20 % maize germ cake can be used without reduced productivity in pigs and poultry rations.
- If badly stored, the feed can turn rancid.
- Maize germ cake can replace maize within the ration for layers and during the fattening period for broilers.
- It is essential to develop a sound feeding plan to avoid any nutritional problems

Further information

Reading

- [Heuzé V., Tran G., Lebas F. \(2015\): Maize germ meal and maize germ. Feedipedia, a programme by INRA, CIRAD, AFZ and FAO. https://www.feedipedia.org/node/716. Last updated on October 27, 2015, 16:23. Available at https://www.feedipedia.org/node/716](https://www.feedipedia.org/node/716)
- Tong Wang, Pamela J. White (2019): [Lipids of the Kernel](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/corn-germ). In: Serna-Salviar, Sergio (2019): [Corn \(Third Edition\)](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/corn-germ), AACC International. Available at <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/corn-germ>

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