

avoided. Protective eye goggles and respiratory apparatus are recommended.

16 Regulatory Status

Included in nonparenteral medicines licensed in the UK. Listed in the Canadian Natural Health Products Ingredients Database.

17 Related Substances

Dextrates; dextrin; maltodextrin; starch.

18 Comments

Maltodextrins may be used as the term for maltodextrins and corn syrup solids. Corn syrup is used to describe hydrolyzed starches with a DE ranging from 20 to ≈ 99 .

Corn syrup solids are used to control sugar crystallization, with the lower DE values being the most effective. They are used frequently as a secondary sweetener to sucrose because corn syrup solids aid in resisting discoloration caused by heat.

Corn syrup solids are digestible carbohydrates with a nutritional value of ≈ 17 kJ/g or 4 kcal/g. In oral nutritional supplements, they are used as a carbohydrate source with a lower osmolarity than an isocaloric amount of dextrose. For diabetics, they should be considered as a source of carbohydrate similar to dextrose. Partially hydrolyzed corn syrup solids have been investigated as a replacement for lactose in manufactured liquid diets for neonatal pigs.⁽⁷⁾ Corn syrup solids used in the food industry include *Clintose CR 24* (Archer Daniels Midland Company, USA), *Dry GL* (Cargill, USA), *Dri-Sweet 36* (Ramsen, USA), *Globe* (Corn Products, USA), and *Star-Dri* (Tate & Lyle, USA).

A specification for corn syrup solids (dried glucose syrup) is listed in the *Food Chemicals Codex* (FCC).⁽⁸⁾

19 Specific References

- 1 Tuerck P, *et al.* A new method of manufacture of tablet granulations II. *J Am Pharm Assoc* 1960; 49: 347–349.

- 2 Allen L, *et al.* Dissolution rates of hydrocortisone and prednisone utilizing sugar solid dispersion systems in tablet form. *J Pharm Sci*; 1978; 67: 979–981.
- 3 Kukkar V, *et al.* Mixing and formulation of low dose drugs: underlying problems and solutions. *Thai J Pharm Sci* 2008; 32: 43–58.
- 4 Grain Processing Corporation. Product information: *Maltodextrins and corn syrup solids*, 2011. http://www.grainprocessing.com/index.php?option=com_content&Itemid=81&id=56&lang=en&view=article. (accessed 18 August 2014).
- 5 Bourne M. *Food texture and viscosity: concept and measurement*. 2nd edn. FL, United States. Academic Press, 2002; 80. <http://books.google.com/books?id=eSF6zS8n2QoC&=PA80&=viscosity+of+corn+syrup+solids+20+25+36&=en#v=onepage&=viscosity%20of%20corn%20syrup%20solids%2020%2025%2036&=false> (accessed 18 August 2014).
- 6 Product Bulletin for Maltrin QD M600, Corn Syrup Solids NF, Grain Processing Corporation, Muscatine, IA.
- 7 Oliver W, *et al.* Efficacy of partially hydrolyzed corn syrup solids as a replacement for lactose in manufactured liquid diets for neonatal pigs. *J Anim Sci* 2002; 80: 143–153.
- 8 *Food Chemicals Codex*. [online] Bethesda, MD: United States Pharmacopeia. <http://publications.usp.org> (accessed 31 March 2017).

20 General References

- Grain Processing Corporation. Product information: *Maltrin*, 2011. http://www.grainprocessing.com/index.php?option=com_content&Itemid=81&id=56&lang=en&view=article (accessed 18 August 2014).
- Rahman MS, ed. *Handbook of Food Preservation*, 2nd edn. Boca Raton, FL: CRC Press, 2007; 516.
- State of Utah Department of Health, WIC Program Resources Product Guide. http://health.utah.gov/wic/pdf/forms_and_modules/Resources/Product%20Guide%2001-2012.pdf (accessed 18 August 2014).

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22 Date of Revision

4 May 2017.

Cottonseed Oil

1 Nonproprietary Names

USP–NF: Cottonseed Oil

2 Synonyms

Cotton oil; refined cottonseed oil.

3 Chemical Name and CAS Registry Number

Cottonseed oil [8001-29-4]

4 Empirical Formula and Molecular Weight

A typical analysis of refined cottonseed oil indicates the composition of the acids present as glycerides to be as follows: linoleic acid 39.3%; oleic acid 33.1%; palmitic acid 19.1%; stearic acid 1.9%; arachidic acid 0.6%, and myristic acid 0.3%. Also present are small quantities of phospholipid, phytosterols, and pigments. The toxic polyphenolic pigment gossypol is present in raw cottonseed and in the oil cake remaining after expression of oil; it is not found in the refined oil.

5 Structural Formula

See Section 4.

6 Functional Category

Oleaginous vehicle; solvent.

7 Applications in Pharmaceutical Formulation or Technology

Cottonseed oil is used in pharmaceutical formulations primarily as a solvent for intramuscular injections. It has been used in intravenous emulsions as a fat source in parenteral nutrition regimens, although its use for this purpose has been superseded by soybean oil emulsions; see Section 14. It is also used as an emollient vehicle for other medications.

Cottonseed oil has been used as a tablet binder for acetaminophen; for characterization of the hot-melt fluid bed coating process;⁽¹⁾ in the manufacturing of stable oral pharmaceutical