TECHNICAL SHEET

A multi-functional granulator to produce processed cereal products

Function of the pelletizer

According to the Larousse dictionary (2021), a granulator is a device that allows a powder moistened with water to be transformed into spherical grains. This powder can be a cereal (corn, millet, sorghum, rice, cowpea, etc.), transformed into granules and then consumed in the form of couscous, porridge or other: this is the process of granulation. The latter is the formation of small spherical granules from rewetted flours (Cruz et al, 2020).

In many African countries, rolled or pelleted products are a widely developed way to valorize starchy raw materials (Cruz et al, 2020). They are made from cereals, legumes or tubers such as maize in Benin, sorghum in Mali, millet in Senegal, durum wheat in North Africa, cowpea in Burkina Faso, yam in Togo or cassava in Côte d'Ivoire (Cruz et al, 2020). A distinction is often made between the two major product groups of steamed pellets and pellets that are simply dried for consumption as porridges (Cruz et al, 2020).

The three major routes found in industry for agglomeration of powders are: wet granulation (followed by drying and possibly compression); dry granulation (followed by a crushing-sifting step and then possibly compression); and direct compression of a dry powder mixture (Tita-Goldstein, 2013).

Granulation process

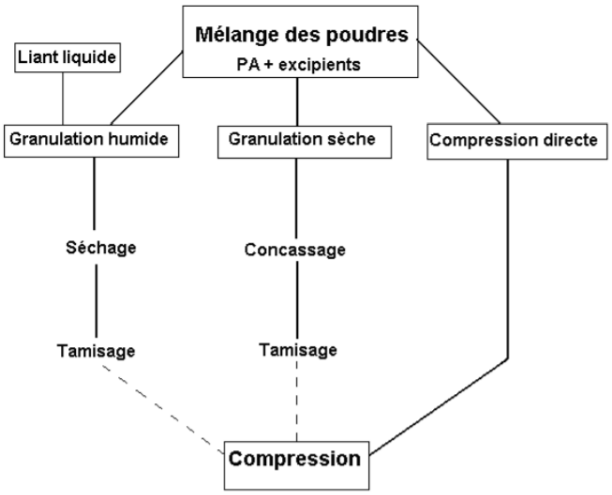

Figure 1 : unit operations allowing the shaping of powders by compression (source : Tita-Goldstein, 2013)

Characteristics of the technology

A multifunctional granulator (several cereals (millet, maize, sorghum, fonio) and several products (couscous, arraw, thiakry, etc.)) compared to existing equipment that is mono-specific.

Bibliographic references

Cruz J-F., Hounhouigan D.J., Havard M., Ferré T. (2020) : La transformation des grains ; Agriculture tropicales en poche ; 201p.

Tita-Goldstein A. (2013) : Mise en forme des poudres par compression : Influence du procédé et de la formulation sur la maîtrise des propriétés d'usage ; Thèse de Doctorat ; Spécialité: Génie des Procédés et des Produits ; Université de Lorraine ; 142p.

Web sites consulted

http://docnum.univ-lorraine.fr/public/DDOC_T_2013_0238_TITA_GOLDSTEIN.pdf ; 09/09/2021 at 11h46

https://agritrop.cirad.fr/594973/1/ID594973.pdf ; 09/09/2021 à 11h54

https://www.larousse.fr/dictionnaires/francais/granulateur/37889#:~:text=Appareil%20servant%20%C3%A0%20agglom%C3%A9rer%20les,alimentaires%20(poudre%20de%20lait); 09/09/2021 at 12h10

Other references

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