Extrusion Processing of Neglected and Underutilized Species: Prospects, Challenges and Opportunity for Food Security in Africa

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Introduction

- Neglected and Underutilized Species have great potential towards food security, sustainable agriculture and improving the socio-economic aspect in the poor rural sector of Sub Sahara Africa.
- One of the means to enhance the contribution of neglected and underutilized species to food security and to incomes of the rural poor is by the expansion of the processing technology.
- There is the need for proper processing to other forms to improve the face value of products after harvest.
- Food extrusion is a process in which food ingredients are forced to flow, under one or several conditions of mixing, heating and shear, through a die that forms and/or puff-dries the ingredients. for producing a range of products with different shapes, textures, colours, flavours from basic ingredients, thereby increasing the variety of food in the diet and also materials for the industry.
- In this paper, we review the principles of extrusion cooking; provide an overview of the current and future applications of food extrusion relevant to the processing of neglected and underutilized species and identified the challenges for its practice in Sub Saharan Africa.

Food Extruders Classification

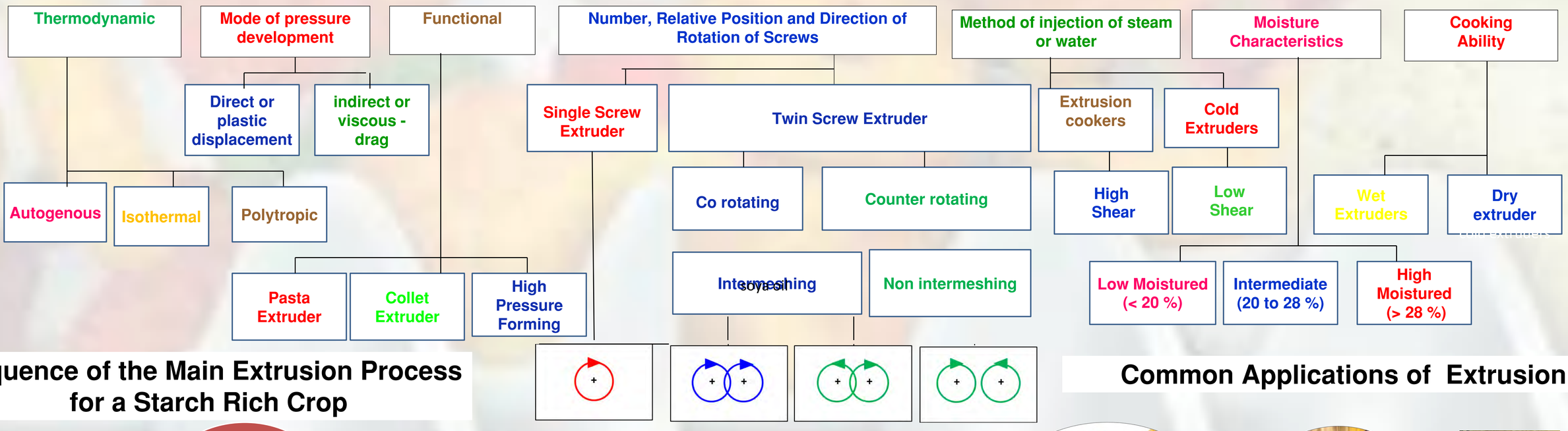

Fig 1: Food Extruders Classification

Sequence of the Main Extrusion Process for a Starch Rich Crop

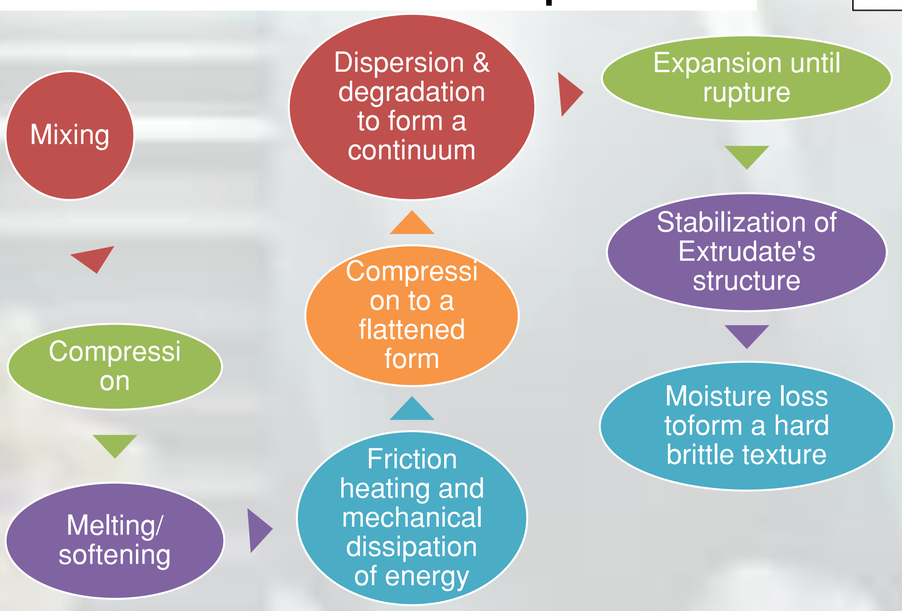

Fig 2:Sequence of the main extrusion process for a starch rich recipe

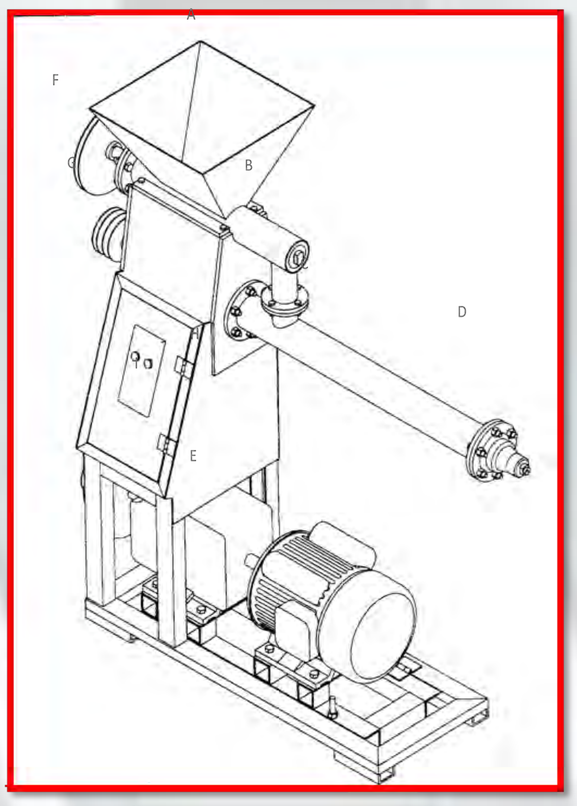

Fig 4: Isometric View of a locally developed Single Screw Food Extruder

Common Applications of Extrusion

Fig 5: Common Application of Extrusion

System Analyses for Extrusion Cooking

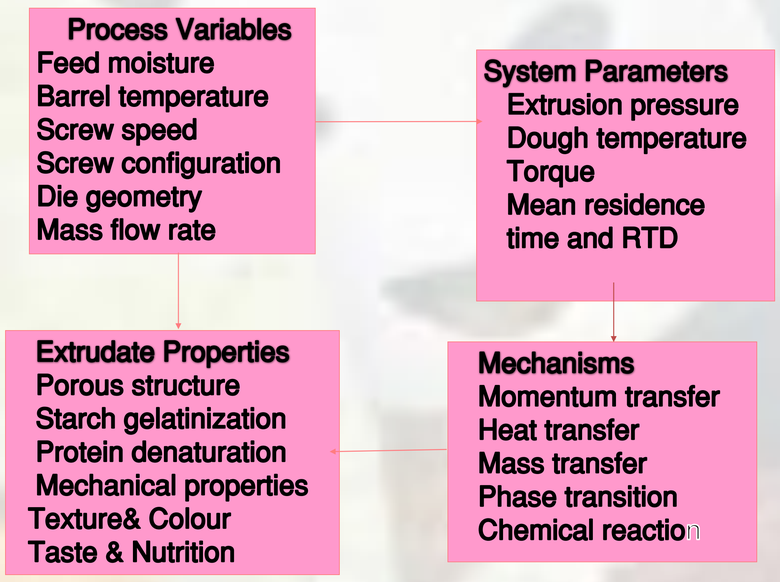

Fig3: System analyses for extrusion cooking (Chang and Galek 1991).

Conclusion

The prospects, applications and challenges of food extrusion to the processing of neglected and underutilized species have been reviewed

References

Chang, K. C. and Halek, G. W. (1991). Analysis of Shear and Thermal History during Co-rotating Twin-Screw Extrusion J. of Food Sci. 56 (2): 518

Challenges

- Optimization of extrusion properties.
- Data analysis for evaluation of optimal conditions for extrusion processing.
- Develop a model to obtain desired physical properties of extrudates.
- Online, real time measurement of process variables