



INTRODUCTION

Cellular Agriculture is an emergent biotechnology that aims at the production of animal protein via cell culturing with the goal of reducing the environmental impact of animal intensive farming. Despite the quick development of the field, several challenges exist in scaling-up cultivated meat production (e.g., growth factor cost). Between them, the use of Foetal Bovine Serum (FSB) as source of nutrients in the cell-culture medium poses several challenges related to the sourcing and use of this component (e.g., identification of a general and chemically-defined formulation of the serum) [1]. The aim of this study is to evaluate the proximate composition analysis of sidestreams to identify possible macromolecules to include in the formulation of a plant-based serum-free cell-culture medium for cultivated meat production.

SIDESTREAMS



Apple pomace



Corn cob



Rice bran

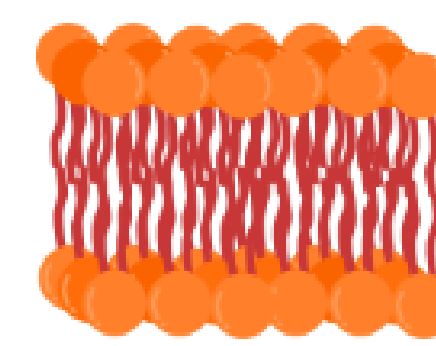
METHODS



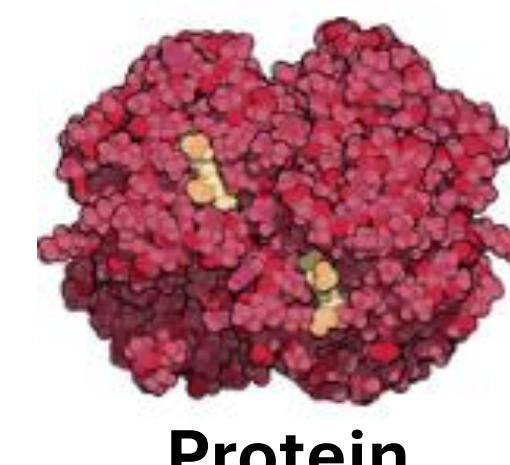
Water



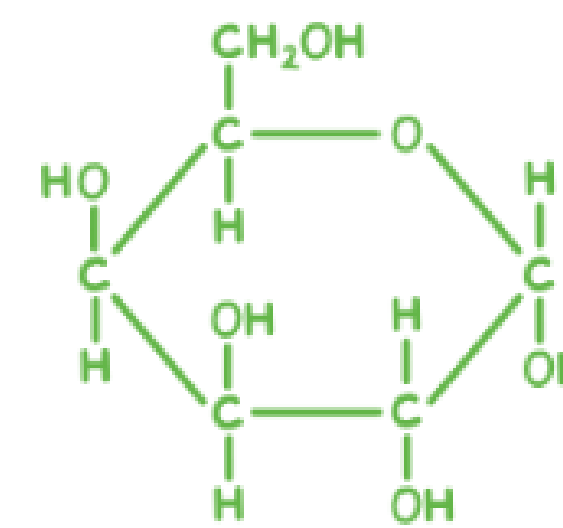
Ash



Lipids



Protein



Carbohydrates



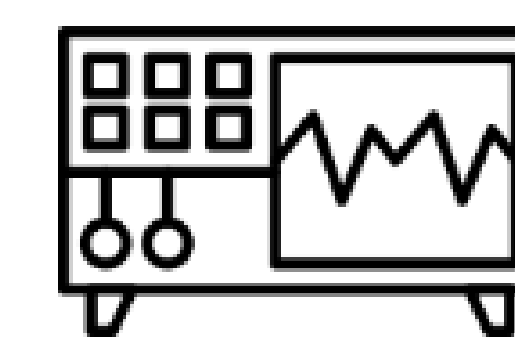
Water content via drying oven



Ash content via muffle furnace



Lipids extraction via Soxhlet



Protein quantification via elemental analyzer



Carbohydrates content via subtraction to 100

Circular economy concept applied to food production via cell agriculture

PROXIMATE COMPOSITION ANALYSIS

Table 1. Proximate Composition Analysis Corn cob + Apple pomace flour

Constituent	%
Carbohydrates	76.1 ± 6.4
Fibers	67.2 ± 6.2
Crude fat	5.5 ± 1.5
Crude proteins	5.4 ± 0.1
Moisture	10.7 ± 0.4
Ash	2.2 ± 0.3

Table 2. Proximate Composition Analysis Rice Bran

Constituent	%
Carbohydrates	37.9 ± 8.0
Fibers	8.9 ± 1.0
Crude fat	24.2 ± 7.9
Crude proteins	15.2 ± 0.4
Moisture	10.2 ± 0.1
Ash	8.5 ± 0.2

CONCLUSIONS

Considering the protein content in the **rice bran** samples, our study confirms the possibility of extracting proteins from rice bran, to be used as aminoacidic source for the formulation of a plant-based **medium** for cultivated meat production.

On the other hand, the proximate composition of the **corn cob** and **apple pomace** flours do not suggest possible application on a macro scale.

REFERENCES

[1] Stout AJ, Rittenberg ML, Shub M, et al. A Beefy-R culture medium: Replacing albumin with rapeseed protein isolates. *Biomaterials*. 2023;296:122092. doi:10.1016/j.biomaterials.2023.122092