



# Fractionation as a method to improve the nutritional value of rapeseed meal

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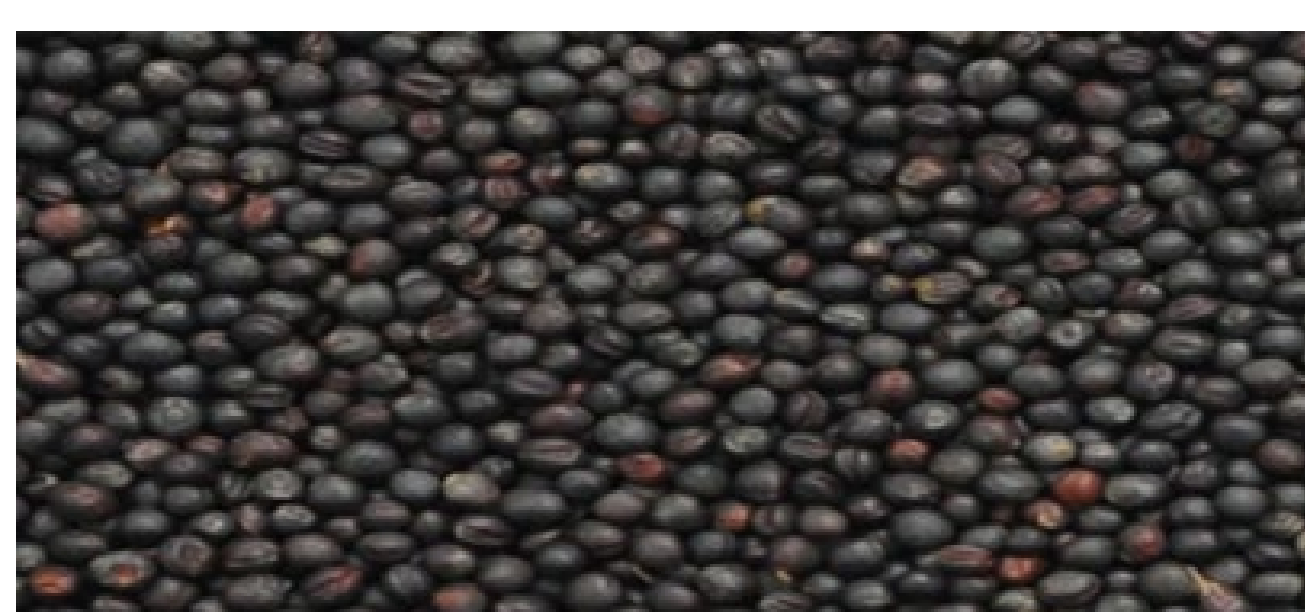
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## ABSTRACT

This study demonstrated the feasibility of fractionation of rapeseed meal (RSM) at lab scale and industrial scale and produced a 15-20% fraction with improved nutritional value. The efficacy of fractionation depends on the origin (crushing plant) of the RSM.

## INTRODUCTION

- Reduce EU dependency on imported protein sources
- Improve utilisation of locally grown sources, e.g. rapeseed
- Rape seed meal (RSM)
  - Not-dehulled before oil extraction
  - Relatively low protein content
  - High fibre content in RSM → limits use in young animals
- Literature: tail-end dehulling may improve nutritional value



## OBJECTIVES

- Determine the feasibility of an industrial scale process for fractionation of RSM and the nutritional value of RSM fractions of different origins.

## MATERIALS AND METHODS

- Lab scale: 5 RSM samples (~50 kg) of different processing plants
- Industrial scale: 13 tonnes of RSM
- Crushing (roller mill) and sieving at 300 µm



- Industrial scale planifter (left) and small scale equipment (right)
- Analyses: Proximate components; Amino acids and reactive lysine; In vitro protein degradation (pH-stat); Fibre components; Glucosinolates; In vivo study by IRTA

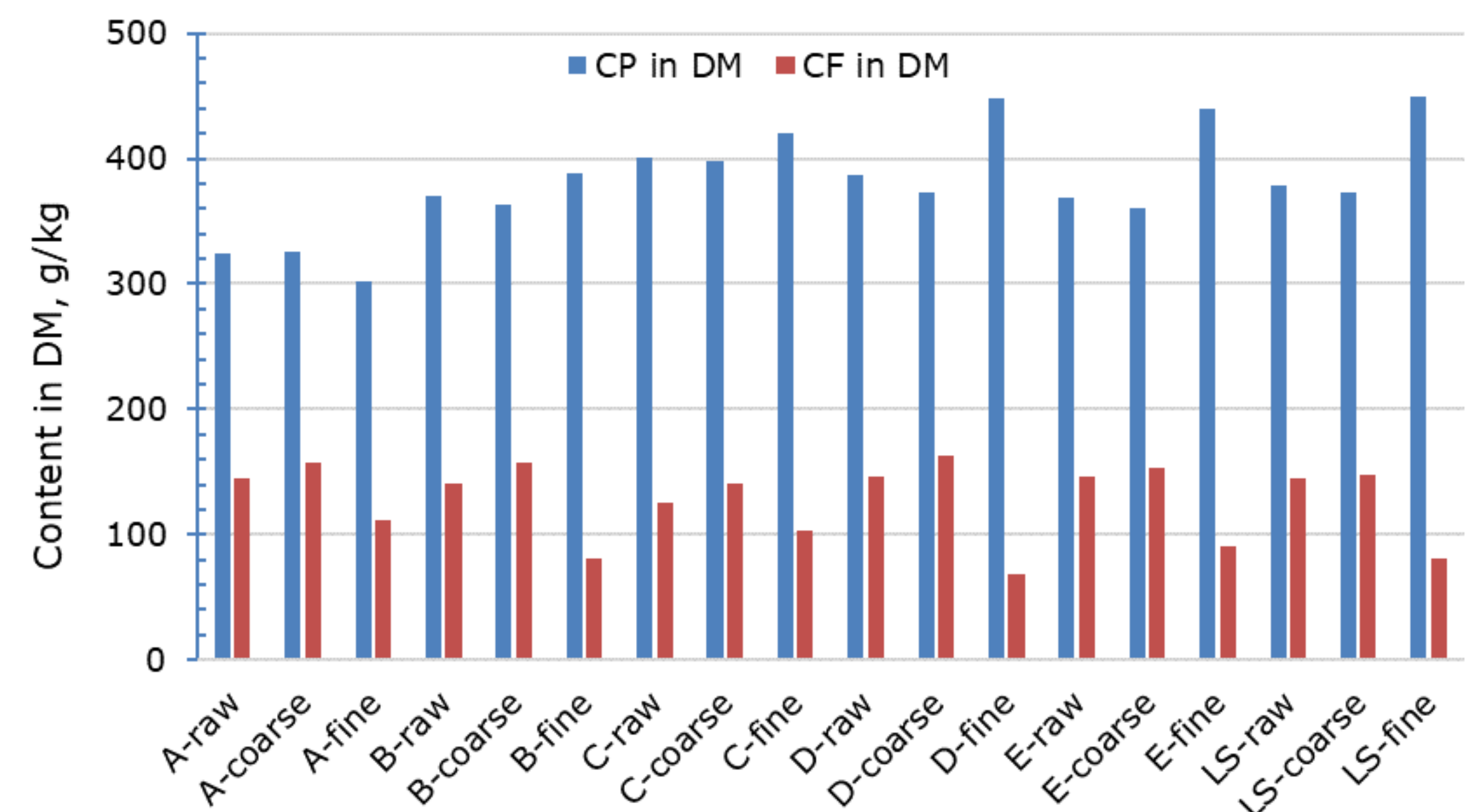
## RESULTS

- 12-20% fine fraction by weight (throughs)
- 14.5% fine fraction for the industrial scale process

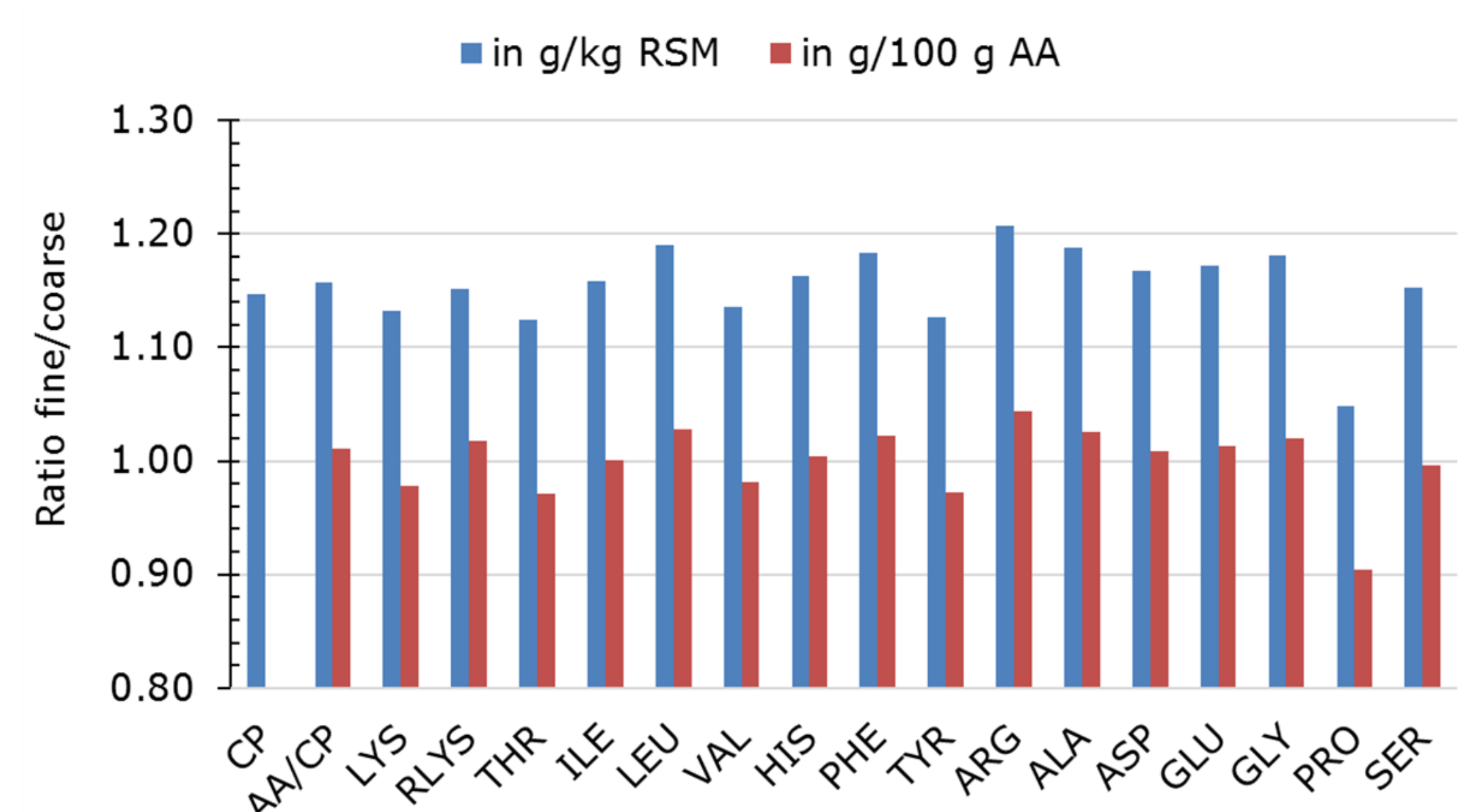


- Coarse (left) and fine (right) fraction of RSM
- Fine fraction:
  - Mean increase in crude protein content from 380 to 430 g/kg DM
  - Variation: +5 to +19% relative increase
  - Mean reduction in crude fibre (CF) from 140 to 86 g/kg DM
  - Overall increase in ash content
  - No major effect on in vitro protein degradation
  - Total glucosinolate content in 80-120% of original RSM

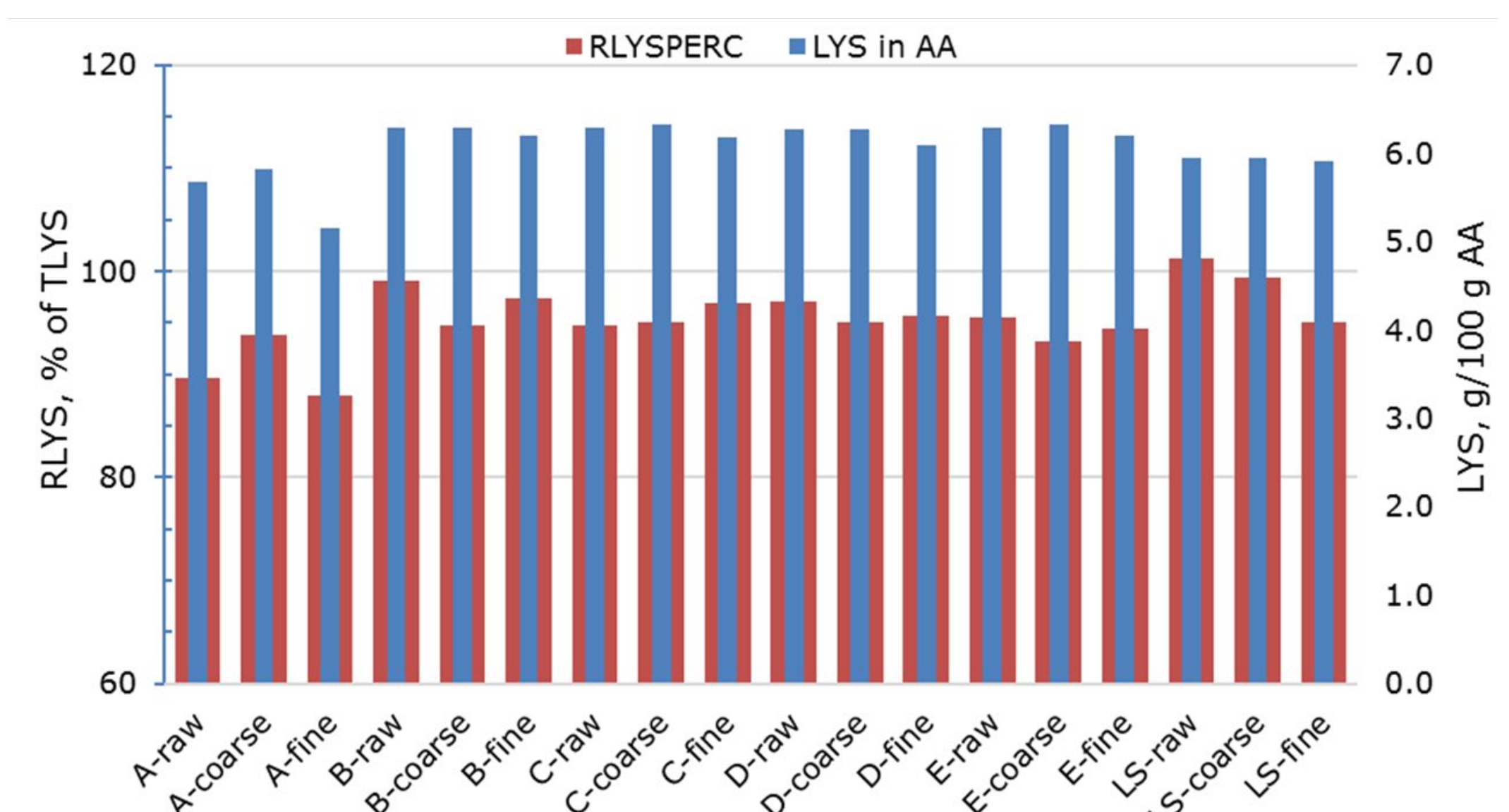
## RESULTS (continued)



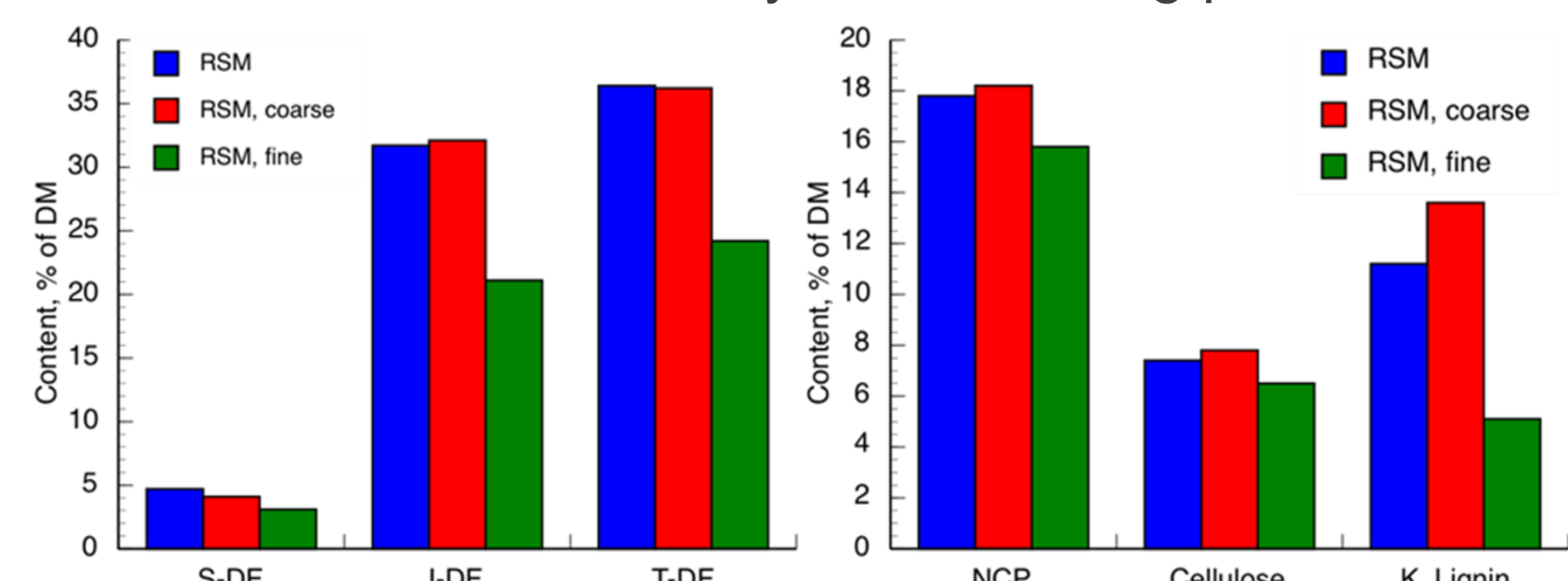
- Fine fraction: higher CP content, lower CF content



- Small, but consistent effect of fractionation on AA-pattern



- Small differences in % reactive lysine; deviating product A



- Reduction in (in)soluble fibre, (non)cellulose polysaccharides and lignin

## CONCLUSIONS

- Fractionation (sifting) can produce a nutritionally improved RSM product with up to 20% higher CP, minor effects on AA-pattern and in-vitro availability (pH-stat, reactive lysine) and substantially lower fibre fraction
- Efficacy of the process depends on origin (crushing plant) of the oil seed
- Insight required in influencing factors during oil crushing

## CONTACT

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## Feed-a-Gene



Feed-a-Gene is a European H2020 project involving 23 partners which aims to adapt feeds, animals and feeding techniques to improve the efficiency and sustainability of pig, poultry and rabbit production systems. It is coordinated by INRAE (France), started in March 2015 and will last 5 years. The project aims to reduce the environmental impact of monogastric livestock production by improving and diversifying animal diets and feed technologies and by integrating new selection criteria for these animals. The Feed-a-gene project further aims to develop new management systems for precision feeding and precision farming and to evaluate the overall sustainability of the different management solutions proposed in the project.



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