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By-products from quinoa seeds: whole flour, germ, starch, oil and protein isolates.

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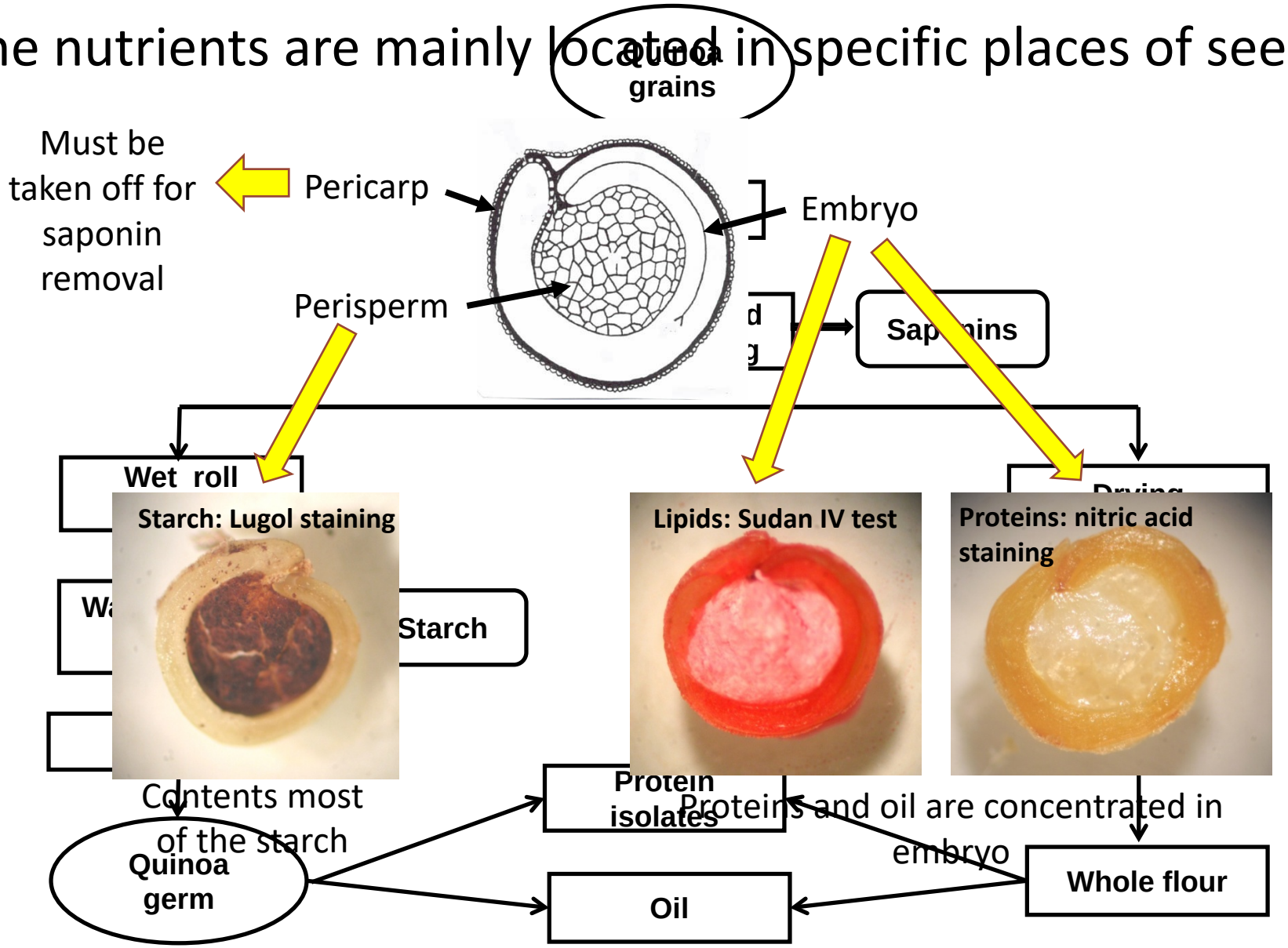
Introduction

The well-known advantages of quinoa

- Quinoa shows:
  - Good adaptability to different edaphoclimatic conditions.
  - High-quality, lysine-reach proteins
  - A good quality oil
  - And the starch, with a content similar to cereals and interesting functional properties.
- The objectives:
  - Obtaining of value-added by-products such as germ, proteins, starch and lipids, through proper milling processes.

Materials and Methods

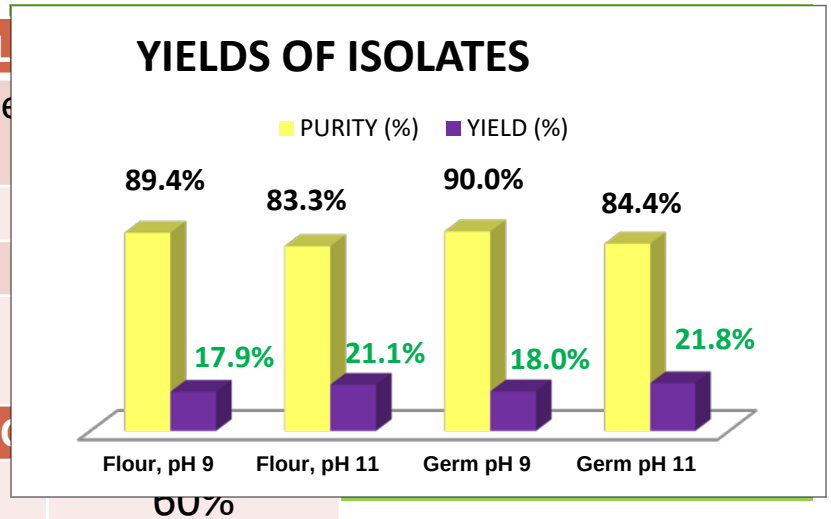
The nutrients are mainly located in specific places of seeds:



Results

Sample	Proteins
Quinoa whole flour	15.2
Quinoa Germ	36.7
Corn whole flour	9.5
Corn germ	6.7

Fatty acids	Quinoa whole flour
18:2	55.0 %
18:1	27.6 %
Total	



Whole flour or germ powder

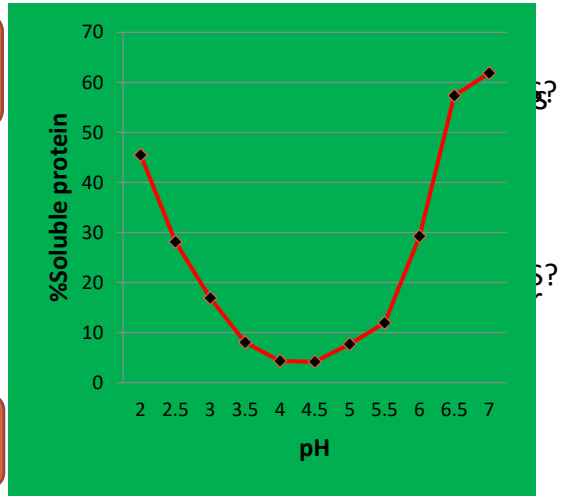
- Alkaline extraction
- pH 9 - 11

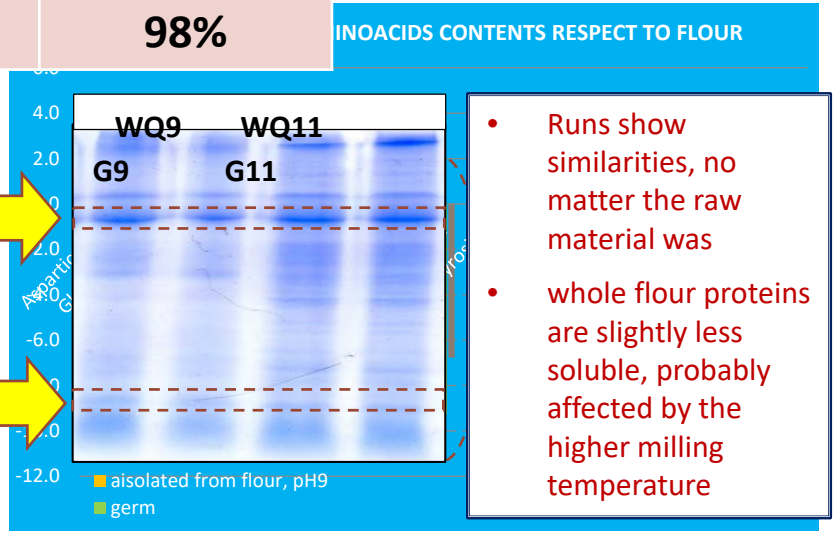
Quinoa protein extracts

- Isoelectric precipitation
- pH 4.0 – 4.5

Quinoa protein isolate

- No significant differences between starting materials.
- Extration from germ was faster, due the lower starch content
- Main losses are observed with ***proline*** and ***cysteine***





- Runs show similarities, no matter the raw material was
- whole flour proteins are slightly less soluble, probably affected by the higher milling temperature

Conclusions

- The wet milling process succeeded splitting up germ from starch
- Germ showed high levels of protein and lipids
- The isolates were easier obtained from germ
- Also, the proteins showed excellent nutritional quality
- Some not-essential amino acids losses can be related to both processes


THANK YOU