

Nutritional and processing properties of Australian mungbean

Daniel Skylas

Supervisors:

Dr Ken Quail (AEGIC)

Professor Chris Blanchard (CSU)

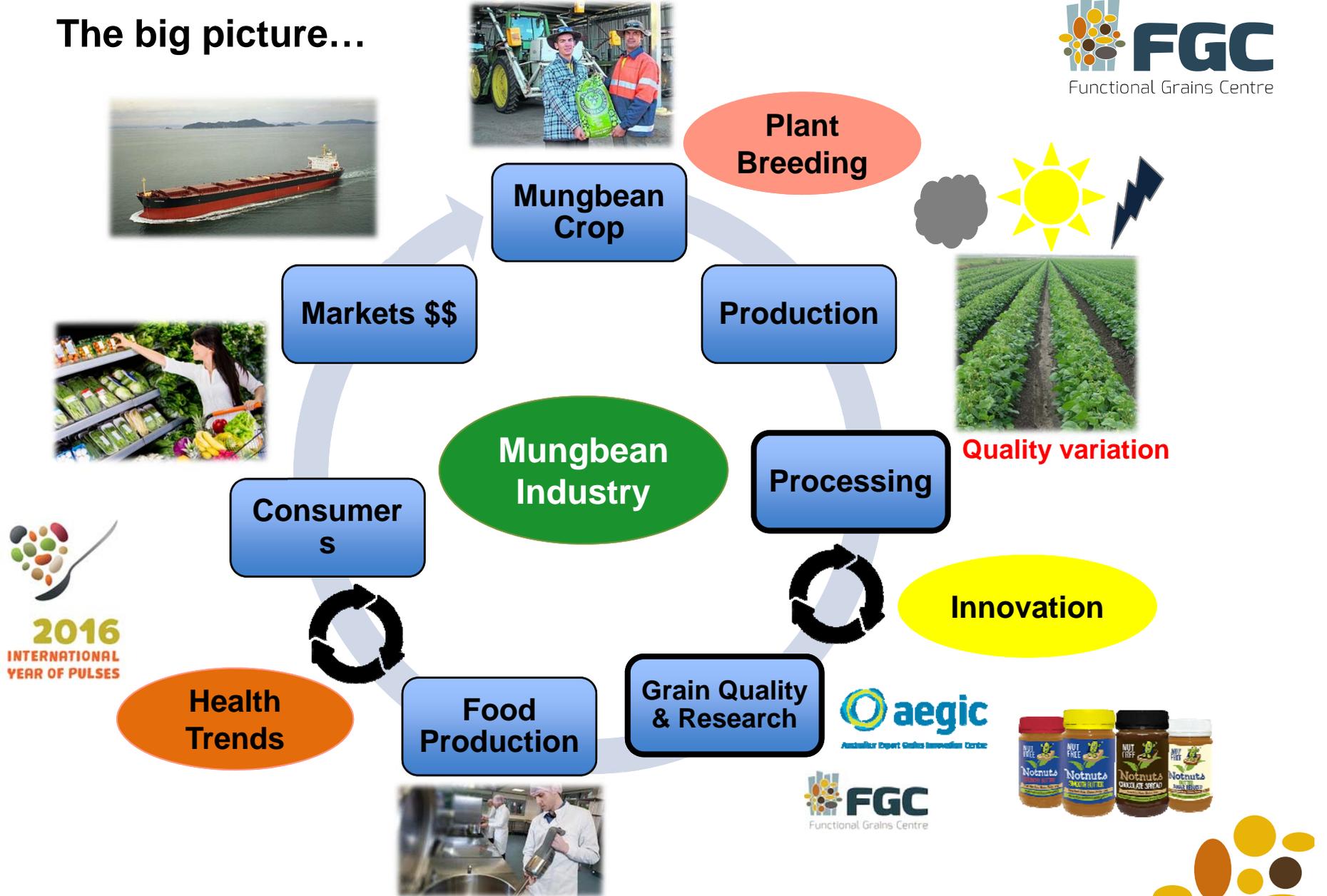


Overview

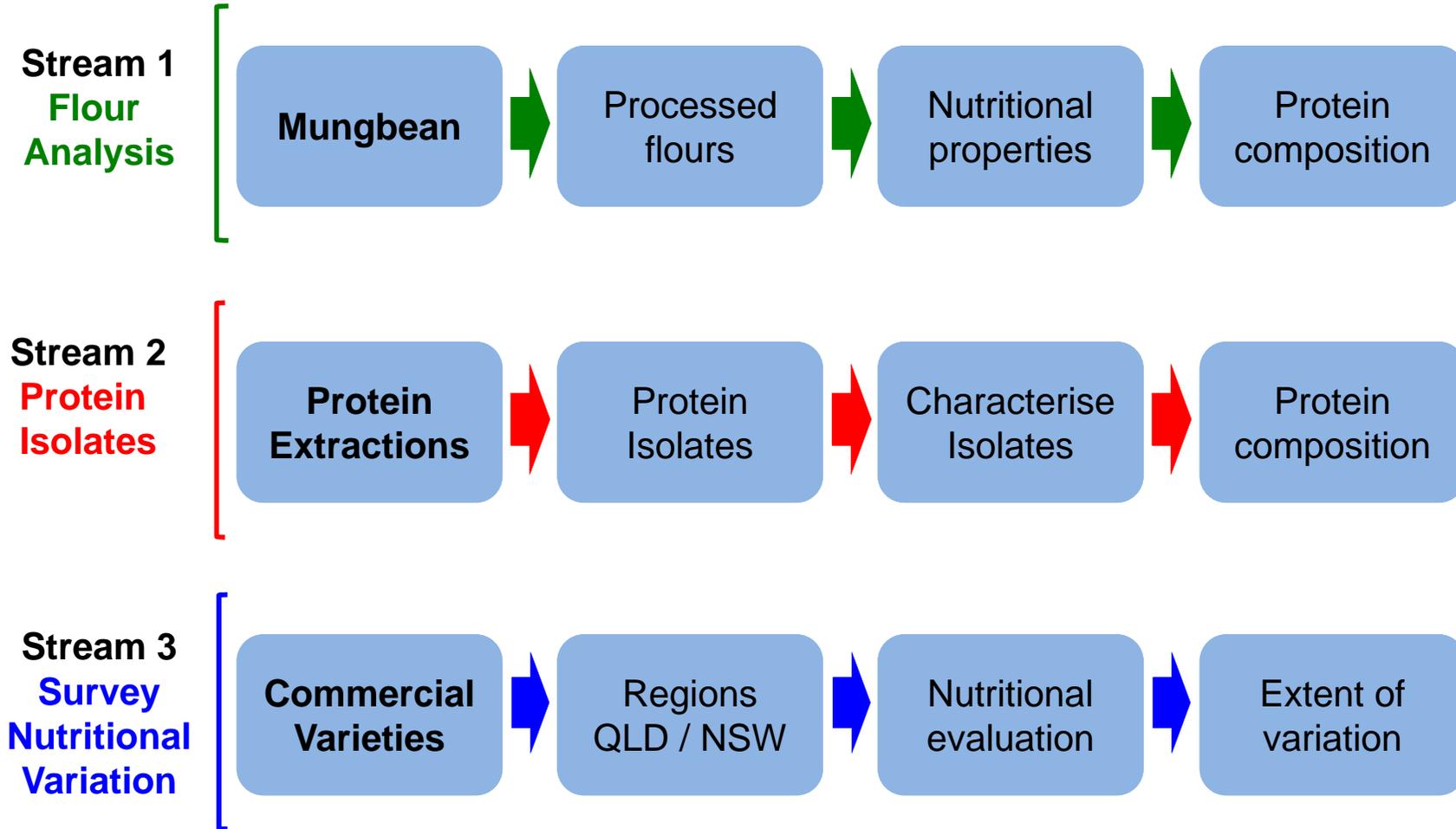
- Brief look at the Australian mungbean Industry
'The big picture'
- Outline of research streams
- Progress so far
- Ongoing and future work



The big picture...



Research Streams - Overview



Stream 1: Processing of mungbean flours

Varieties →



Crystal



Satin II



Celera II-AU



Processing → Milled to flour for analysis

Processing can impact:

- Nutrition
- Appearance
- Flavour / aroma

Primary processing



Whole

Split

Dahl

Secondary processing



Germinated



Roasted



Nutritional composition of flours

Primary processing



Whole

Split

Dahl

Secondary processing



Germinated



Roasted

Nutrient	Whole	Split	Dahl	Germinated	Roasted
TDF (%)	10.6	9.7	4.6	13.1	3.4
IDF/SDF	2.5	2.0	2.5	7.7	16
Starch (%) (dry basis)	45.4	48.5	53.1	42.6	51.9
Protein (%) (dry basis)	27.6	27.9	28.3	29.4	27.8

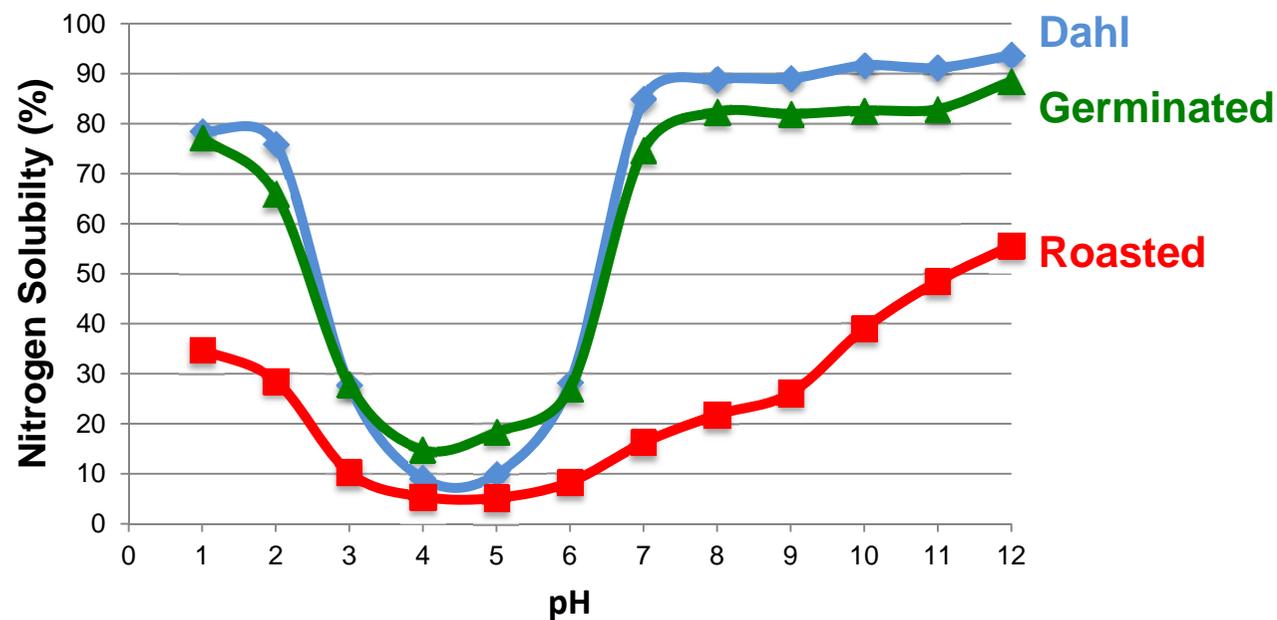


Stream 2: Mungbean protein isolates

Mungbean Flour	Protein (%)	Yield (%)
Dahl	89.1	80.8
Germinated	88.4	65.9
Roasted	90.4	27.1

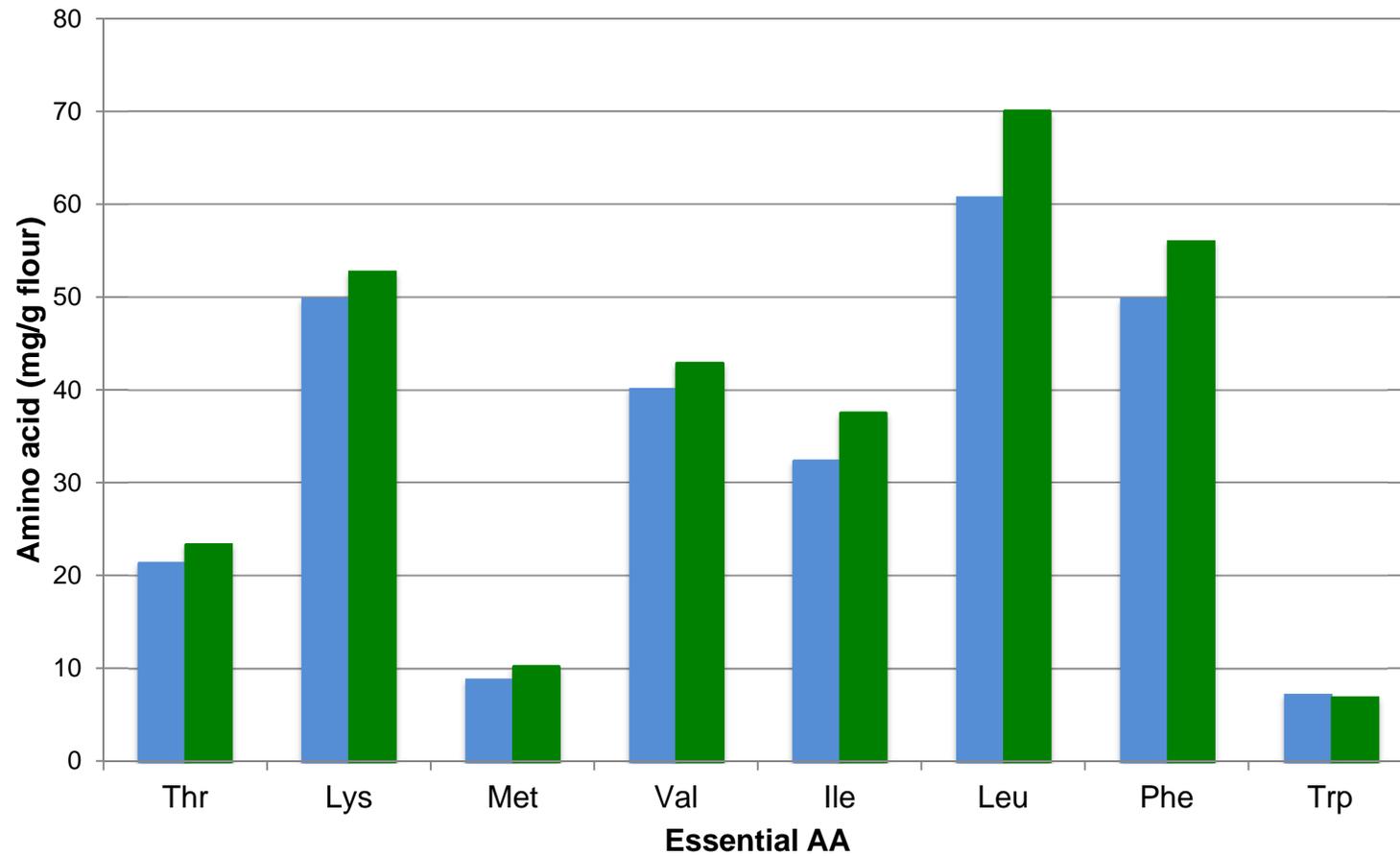

 Pilot-scale trial
 ~2Kg protein (75%)

Mungbean flour – nitrogen solubility profile



Protein isolates - essential amino acid profile

Dahl flour versus germinated flour



Stream 3: Nutritional variation in commercial varieties

- Previous work so far based on a single variety (Crystal)
- Are there better varieties or nutritional properties to work on?
- Level of variation between varieties & growing regions?
- Survey on nutritional variation:

Varieties

- Crystal
- Satin II
- Celera II-AU

Regions

- Warra QLD
- Hermitage QLD
- Liverpool Plains NSW
- Northern NSW

Protein content
Amino acid composition

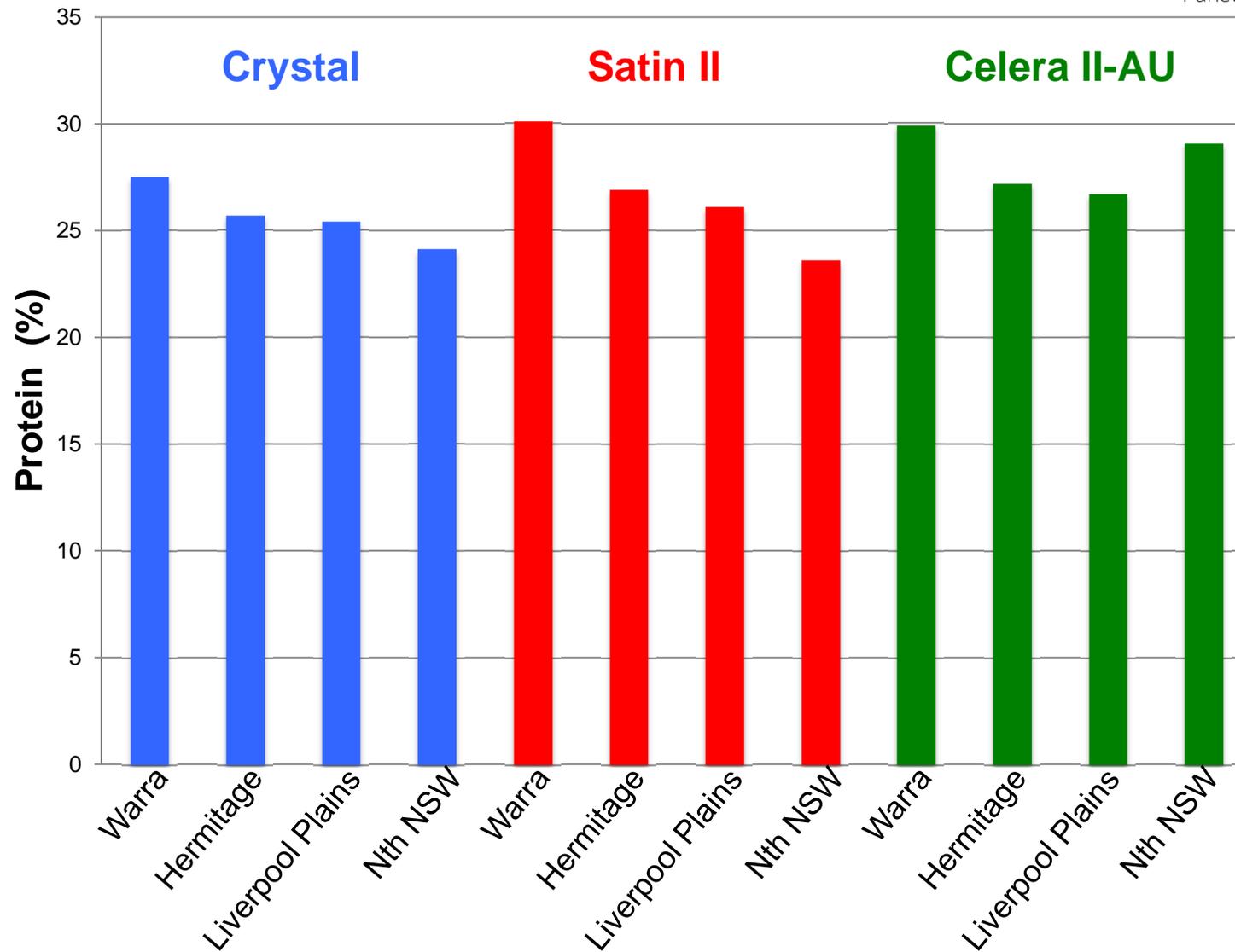
Dietary fibre composition
Insoluble / Soluble / RS

Total starch / Amylose
Pasting profile (RVA)

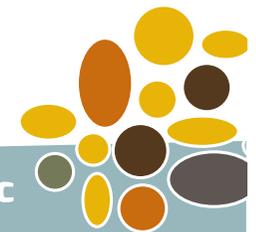
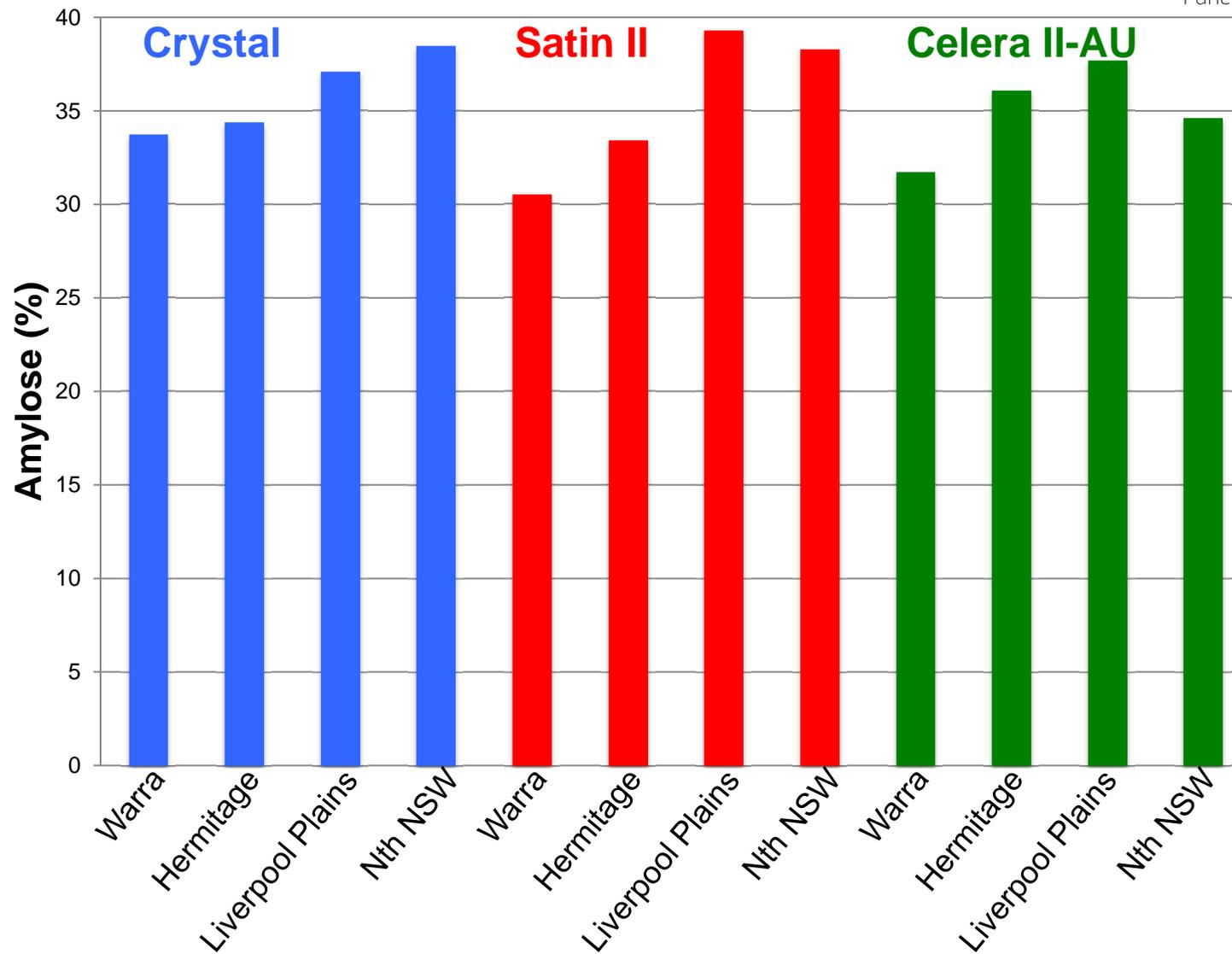
Anti-nutritional content



Protein (on dry basis)

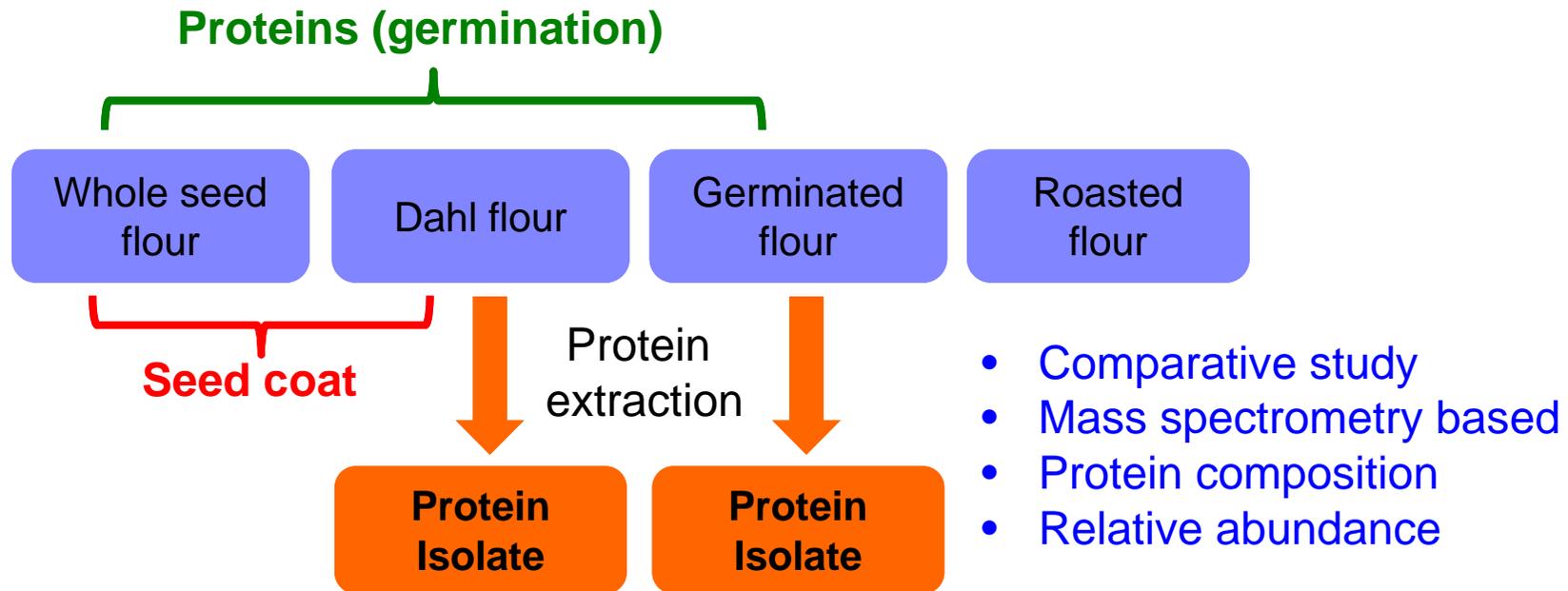


Amylose (% of total starch)



Ongoing and Future Work.....

Proteomic analysis of mungbean flours & protein isolates (sent to APAF)



- Continue protein work / extractions / characterisation
- Expand survey on nutritional variations (start on Faba bean varieties)



Acknowledgements



- ❑ All the staff at AEGIC in Sydney (Analytical Laboratory)
- ❑ All the FGC team
- ❑ Supervisors Dr Ken Quail and Prof. Chris Blanchard



Australian Government
Australian Research Council

