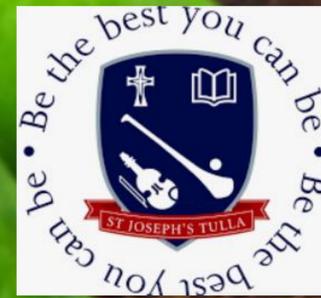


Pea Power A Sustainable Protein Crop. An investigation into the protein content in organically grown Irish and international pea varieties from the ISSA Irish seed savers

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Introduction

This project investigates the protein content of organically grown pea varieties from the Irish Seed Savers, focusing on both Irish and international cultivars. Plant-based proteins, particularly pea protein, are increasingly recognised for their environmental and health benefits, especially in the context of rising global protein deficiencies and concerns over genetically modified crops like soy. The study aims to identify pea varieties with the highest protein concentration, focusing on their adaptability to Ireland's maritime climate and the influence of environmental and genetic factors on protein content.

Literature Review

Over the past decade, there has been a growing demand for alternative protein sources due to concerns over health, ethics, and environmental impact. Pea protein, low in allergens, nutritious, and affordable, has emerged as a popular option (Lu et al., 2019). While peas are rich in protein, they are low in some essential amino acids, like methionine and tryptophan, making them complementary to cereal grains (Tobiasz-Salach, 2024). Pea proteins, mainly globulins and albumins, offer unique properties based on their composition and processing methods (Lu et al., 2019).

Methodology

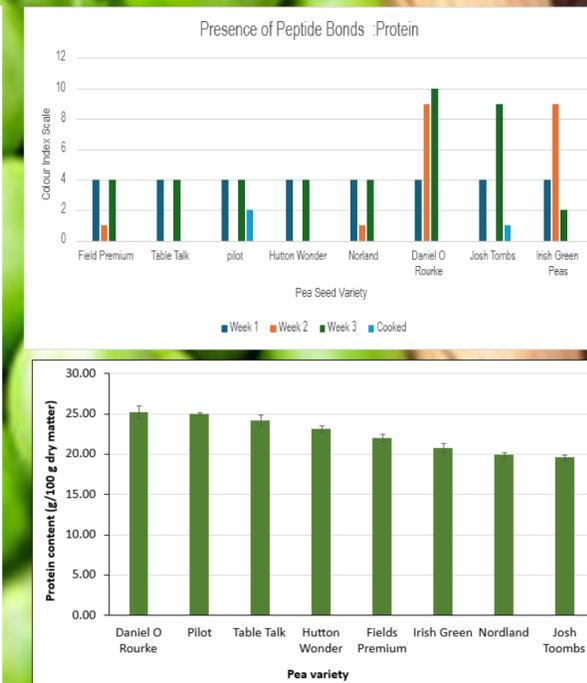
The Biuret method detects protein by forming a violet complex with peptide bonds, while the Kjeldahl method measures nitrogen to estimate protein content.

Results

Biuret and Kjeldahl tests showed that the Daniel O'Rourke variety consistently had the highest protein content, even after refrigeration and cooking, indicating its resilience to temperature stress. Environmental factors, such as temperature and rainfall, were found to affect protein levels, with higher temperatures promoting increased protein content

Ranking the pea varieties based on their suitability to the Irish climate and growing conditions, along with their origins and references:

Rank	Pea Variety	Origin	Reason for Ranking	Reference
1	Irish Green Peas	Irish	Specifically bred for the Irish climate, showing good resistance to local pests and diseases.	(Catstripe, 2024)
2	Daniel O'Rourke	Irish	An Irish heritage variety, well-adapted to local growing conditions.	(Fruit Hill Farm, 2024; Truelove Seeds, 2024)
3	Early Onward	International (UK)	Known for its hardiness and good yield in cool, wet climates like Ireland.	(Teagasc, 2024)
4	Meteor	International (UK)	Another hardy variety that performs well in the Irish climate.	(Teagasc, 2024)
5	Hutton Wonder	International	Likely to perform well due to its general hardiness, though specific data for Ireland is limited.	(Teagasc, 2024)
6	Fields Premium	International	Expected to grow well, but not specifically bred for Irish conditions.	(Teagasc, 2024)
7	Table Talk	International (UK)	Popular in the UK, performs reasonably well in similar climates.	(GardenTags, 2024)
8	Pilot	International	General performance is good, but not specifically noted for Irish conditions.	(Teagasc, 2024)
9	Norland	International (Canada)	Originated in Canada, may not be as well-suited to the Irish climate compared to other varieties.	(APFGA, 2024)
10	Josh Tombs	International	Limited information on its performance in Ireland, likely to be less suited compared to other varieties.	(Teagasc, 2024)



Pea Sample	% Nitrogen (g nitrogen/100 g dry matter)		% protein (g protein/100 g dry matter)	
	Average	Standard deviation	Average	Standard deviation
Daniel O'Rourke	4.66	0.16	25.17	0.85
Pilot	4.63	0.03	25.01	0.19
Table Talk	4.48	0.12	24.19	0.64
Hutton Wonder	4.28	0.08	23.12	0.44
Fields Premium	4.07	0.09	21.99	0.48
Irish Green	3.84	0.11	20.76	0.58
Norland	3.68	0.06	19.85	0.32
Josh Tombs	3.62	0.07	19.56	0.38

CONVERSION FACTOR OF 5.4

Conclusion

This study highlights the health and environmental benefits of pea protein as a sustainable alternative to red meat. With heart disease being a leading cause of death in Ireland, a shift to plant-based proteins like pea protein can help reduce cholesterol, obesity, and cardiovascular risks. Pea protein, offering 19-25 grams of protein per 100 grams, is easily digestible and more environmentally friendly than red meat, requiring less space and water while enhancing soil health. Incorporating pea protein into Irish diets could reduce reliance on red meat, promoting better health and supporting environmental sustainability.