

1. INTRODUCTION

- Grain quality of locally grown quinoa is important for its local food applications and dietary contribution.
- It also provides important insights for the right processing methods for improved nutrient bioaccessibility and bioavailability.



OBJECTIVES.

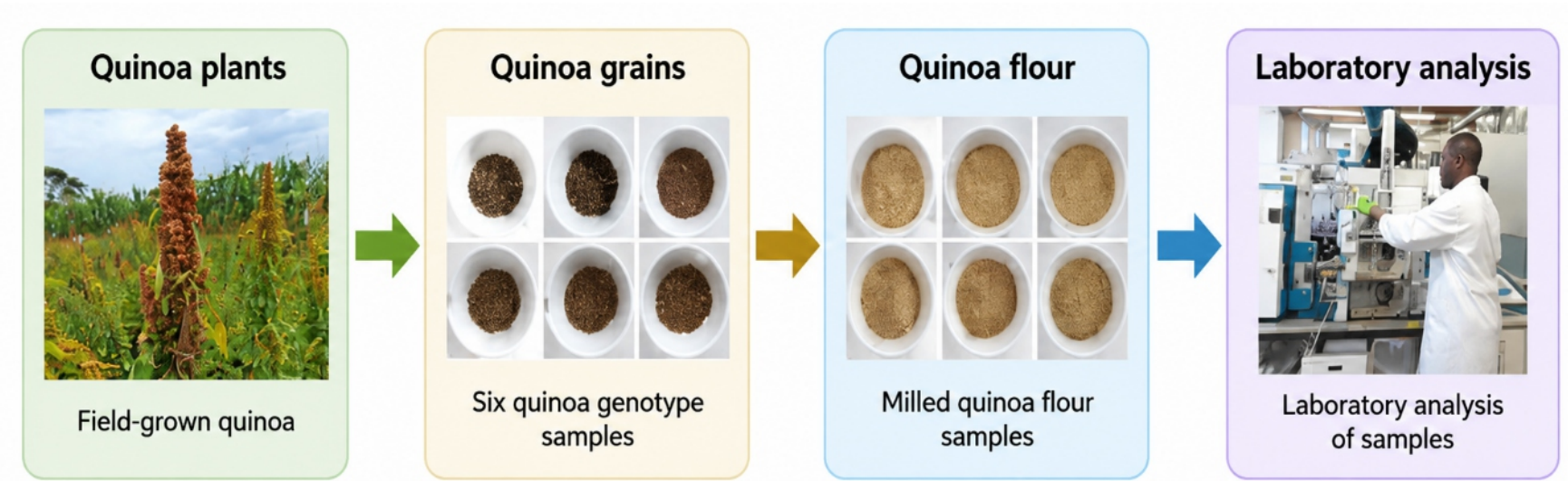
We assessed genotype - dependent variations in six promising genotypes for:

- Proximate and essential mineral contents
- In vitro* protein digestibility
- Mineral bioavailability based on phytate- mineral molar ratios
- Functional properties and potential food applications

2. WHY QUINOA?

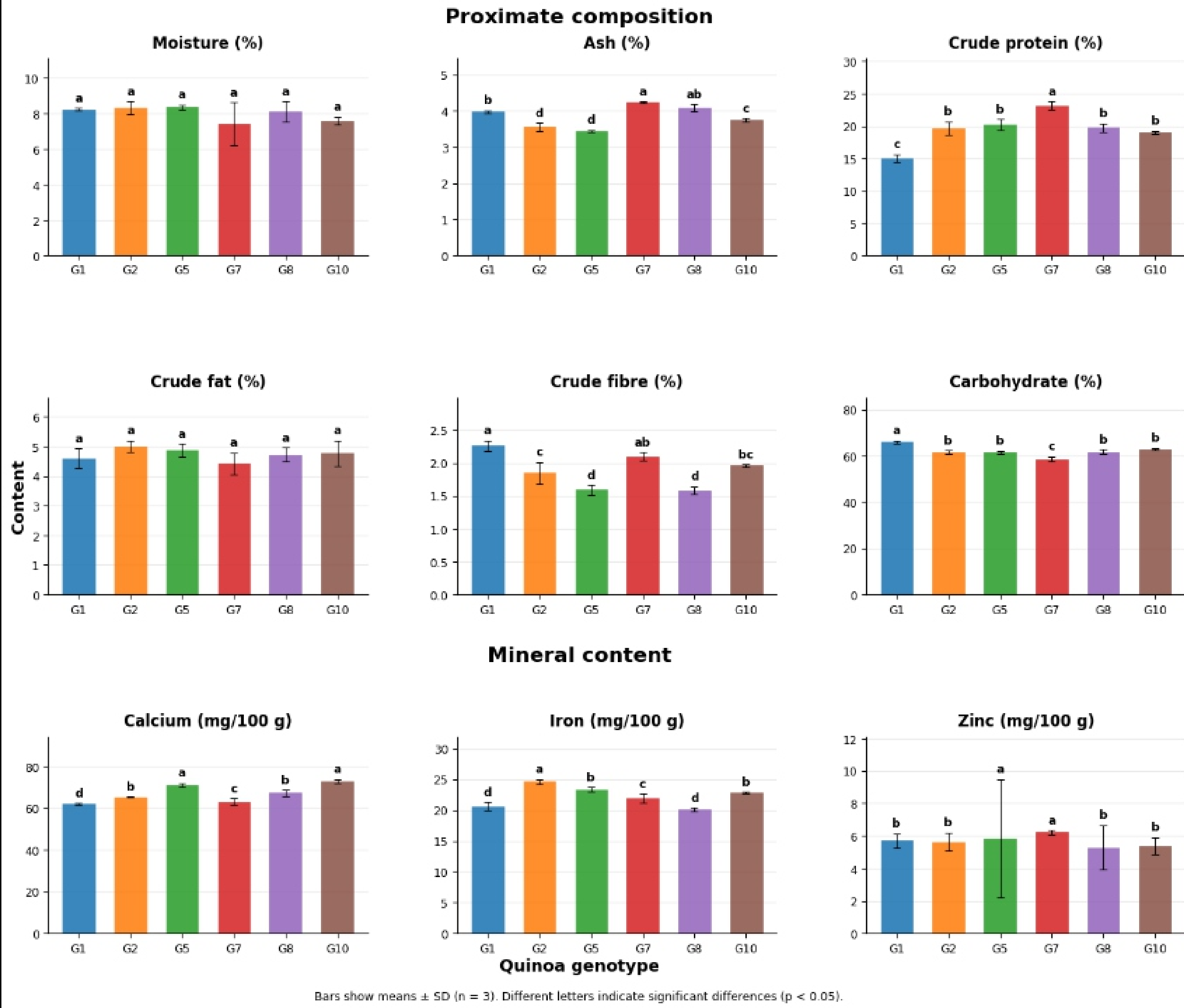
- Wider agro-ecological adaptability.
- Short growth cycle and high productivity
- Rich source of protein, minerals and bioactive compounds
- Low glycaemic index

3. MATERIALS AND METHODS



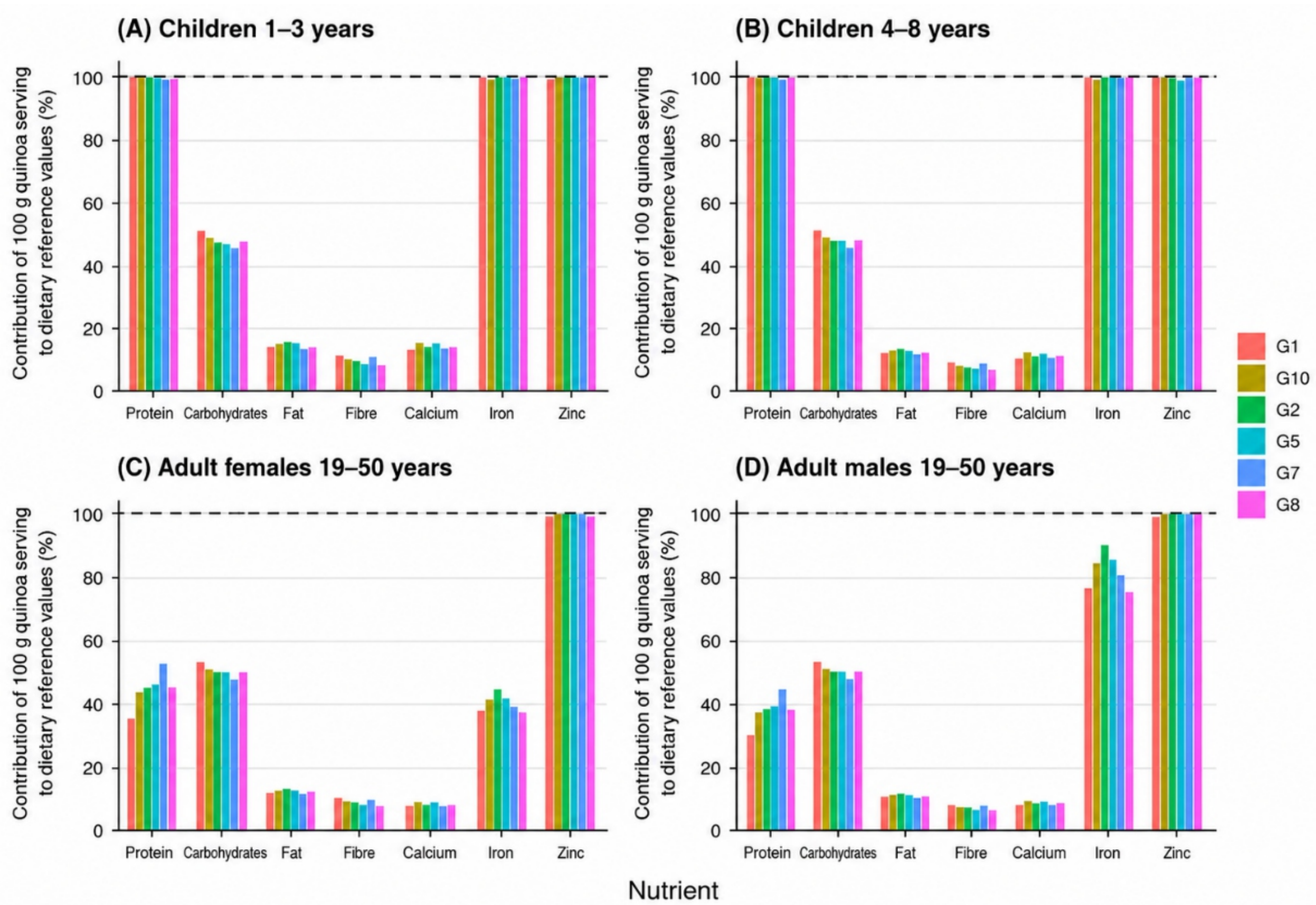
4. RESULTS

Figure 1. Proximate and essential minerals contents



KEY FINDINGS

- Variations in grain quality & functional attributes
- Grain protein ranged from 15.02 to 23.12%
- Phytate showed reduced bioavailability of Ca, Zn and Fe
- Good *in vitro* protein digestibility (70.0 - 79.8%)
- High water - and oil holding capacity (>100%) and good swelling capacity (70.14 - 79.8%)



In vitro protein digestibility (IVPD)

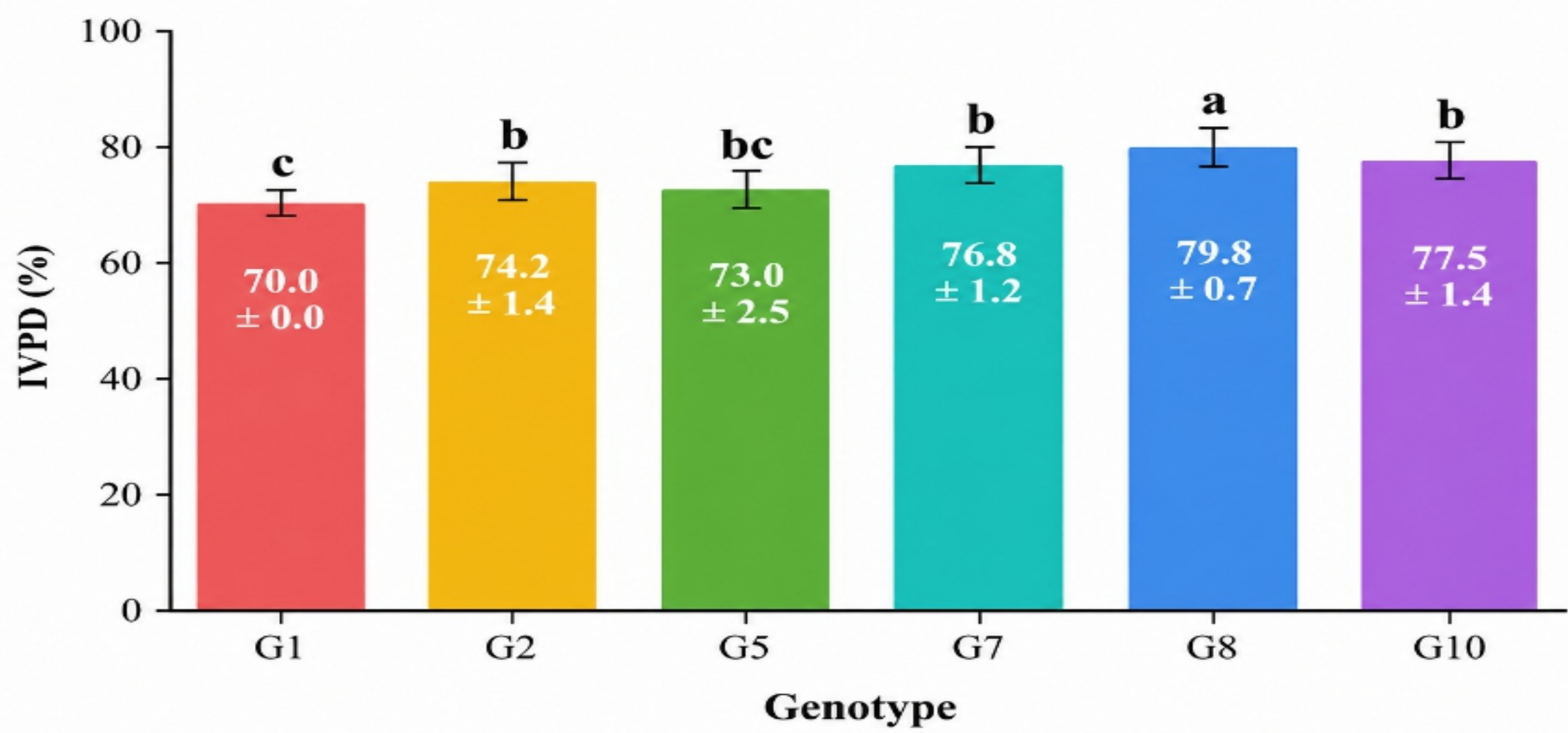
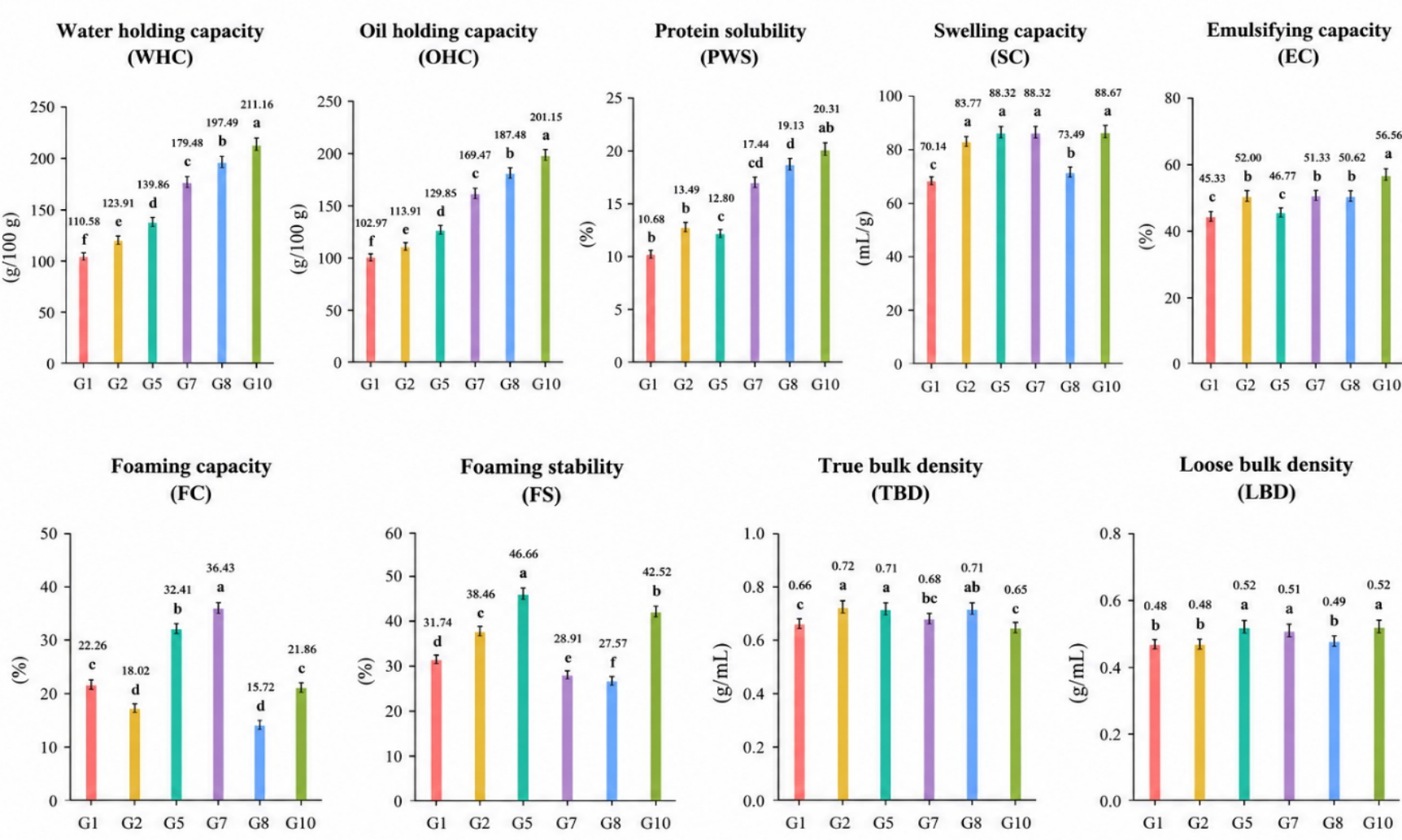


Table 1. Phytate and phytate-minerals molar ratios

Genotypes	G1	G2	G5	G7	G8	G10
Phytate acid	1938.74	2007.03	1952.98	1958.19	1971.04	2013.06
IP _e Fe	7.96	6.90	7.57	7.57	8.28	7.26
IP _e Zn	33.73	35.32	33.23	31.24	37.03	37.11
IP _e Ca	1.90	1.87	1.67	1.89	1.78	1.68
IP _e Ca:Zn	20.62	21.68	20.36	19.18	22.65	22.74



IMPLICATION OF FINDINGS

- Protein and carbohydrate content support quinoa as alternative food for PEM reduction in Kenya.
- Six genotypes studied provide adequate Ca, Fe and Zn.
- Bioavailability of Ca, Fe and Zn would be limited by phytate levels, hence need for processing to reduce phytate levels
- Protein digestibility is good and supports protein dietary value.
- The genotypes flour would support development of acceptable quinoa-based products.

FUTURE RESEARCH

- Multi-location and multi-season adaptability trials
- Product development and consumer studies

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