

# The Colombian Core Collection of *Solanum tuberosum* group Phureja as a source of protein and dietary fibre for breeding programs


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MinAmbiente
Ministerio de Ambiente y Desarrollo Sostenible

PROSPERIDAD PARA TODOS

Contract to access genetic resources RGE0069

Foreign Affairs, Trade and Development Canada

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# Strengthening the agriculture-nutrition link





**Deficiency in nutrients intake in Colombia: protein (36%), iron (15%), zinc (62%), and calcium (86%).**

**52% of mortality in Colombia is related to cardiovascular disease.**

**Potato is the 4$^{th}$ most consumed food in Colombia.**

# Multidisciplinary research



1. Food security and nutrition





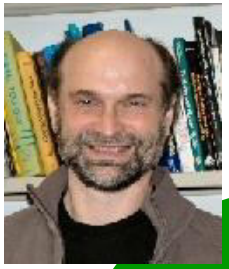


2. Potato breeding



6. Family roles and gender

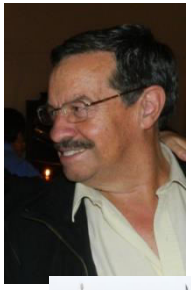




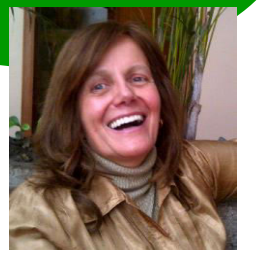
3. Nutritional quality value

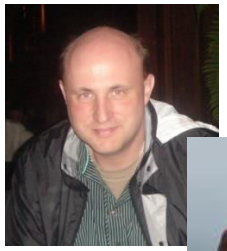






5. Educational program - ECA





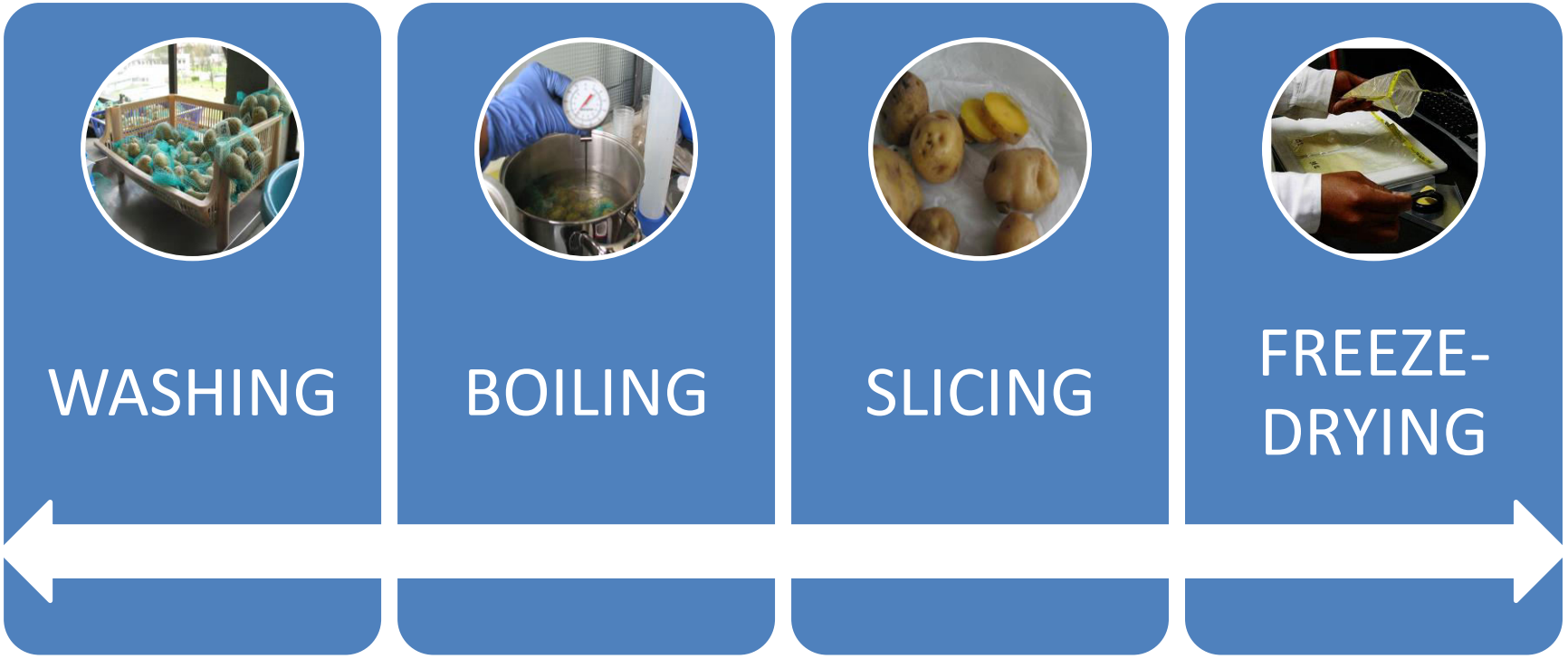




4. Genomics and metabolomics



# Potato tubers are typically consumed in Colombia after boiling



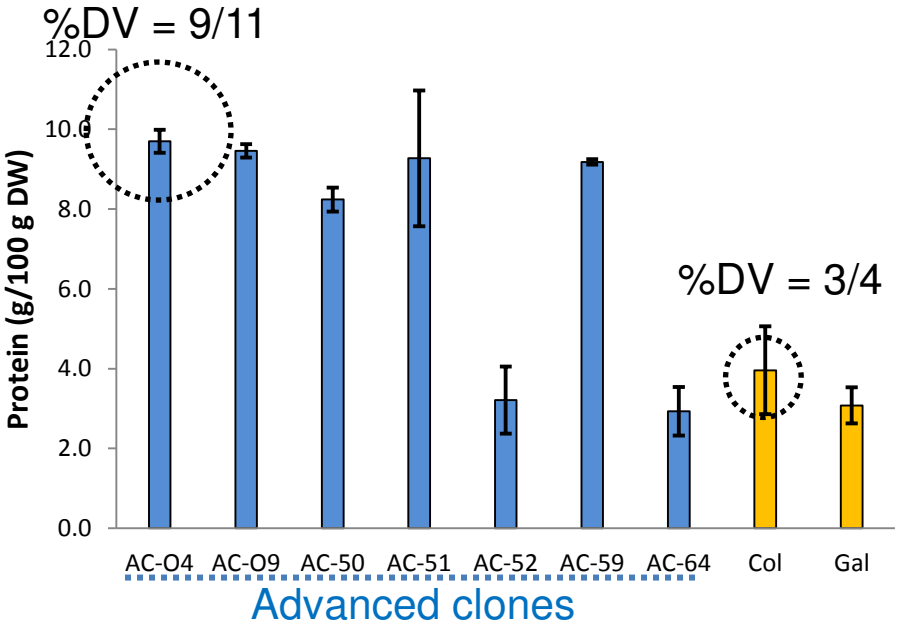

**Protein** AOAC 970.22

**Soluble and insoluble dietary fibre** AOAC 985.29

**Iron, zinc, and calcium** Digestion with $HClO_4$:$HNO_3$
Quantification by ICP-OES


New advanced clones were obtained
by participative research

# Up to 2.4 fold increase of protein in advanced clones (AC) as compared to Criolla Colombia

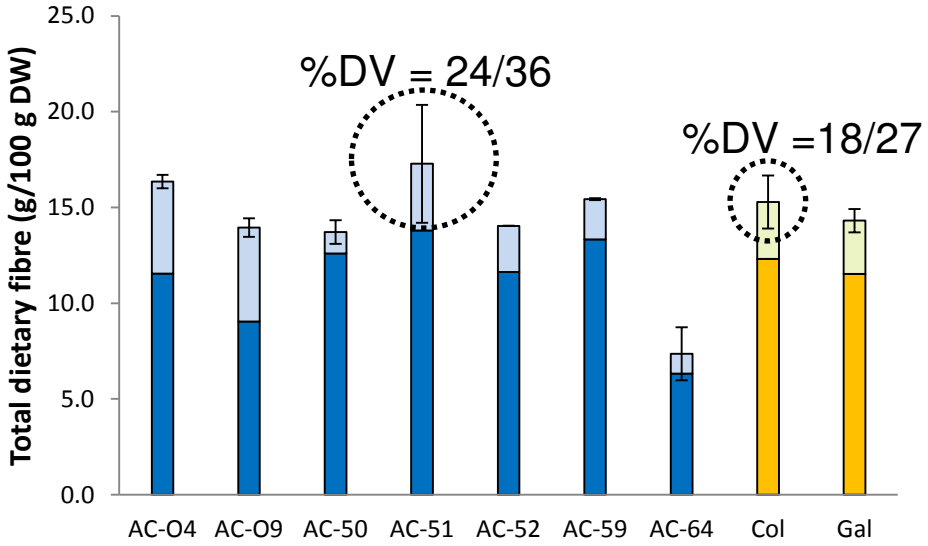



Recommended nutrient intake (RNI) per day for people aged from 19 to 50 years old: 56/46 g (male/female) of protein*

**%DV (daily value) = 231 g potato FW x protein content (g /100 g FW) x 100 / RNI (g)**

*FAO/WHO (2001); USDA (2002)

# Up to 1.2 fold increase of total dietary fibre in advanced clones (AC) as compared to Criolla Colombia

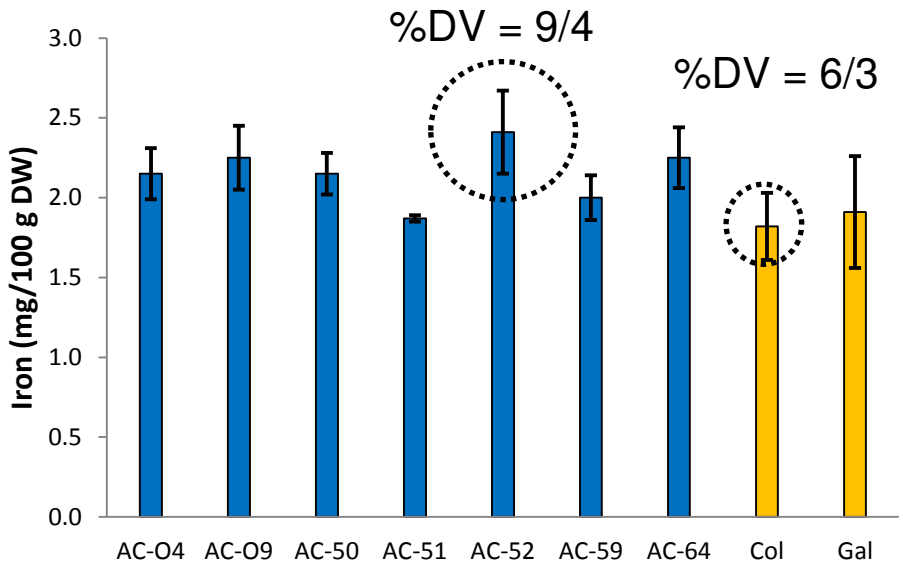



Recommended nutrient intake (RNI) per day for people aged from 19 to 50 years old: 38/25 g (male/female) of total dietary fibre*

**%DV = 231 g potato FW x total dietary fibre content (g /100 g FW) x 100 / RNI (g)**

*FAO/WHO (2001); USDA (2002)

# Up to 1.3 fold increase of iron in advanced clones (AC) as compared to cultivar Criolla Colombia

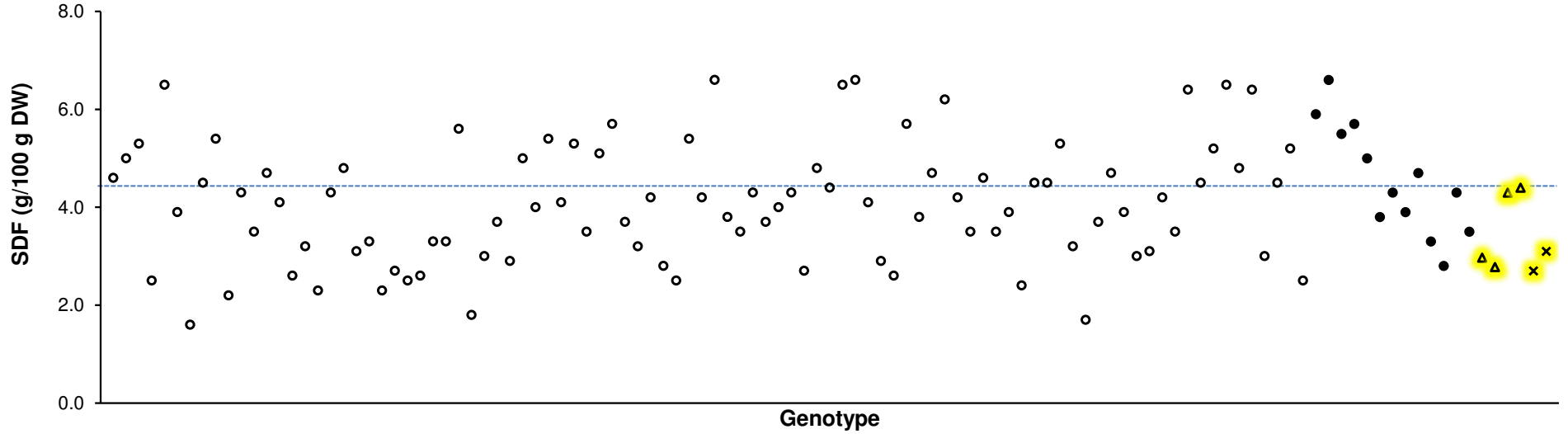


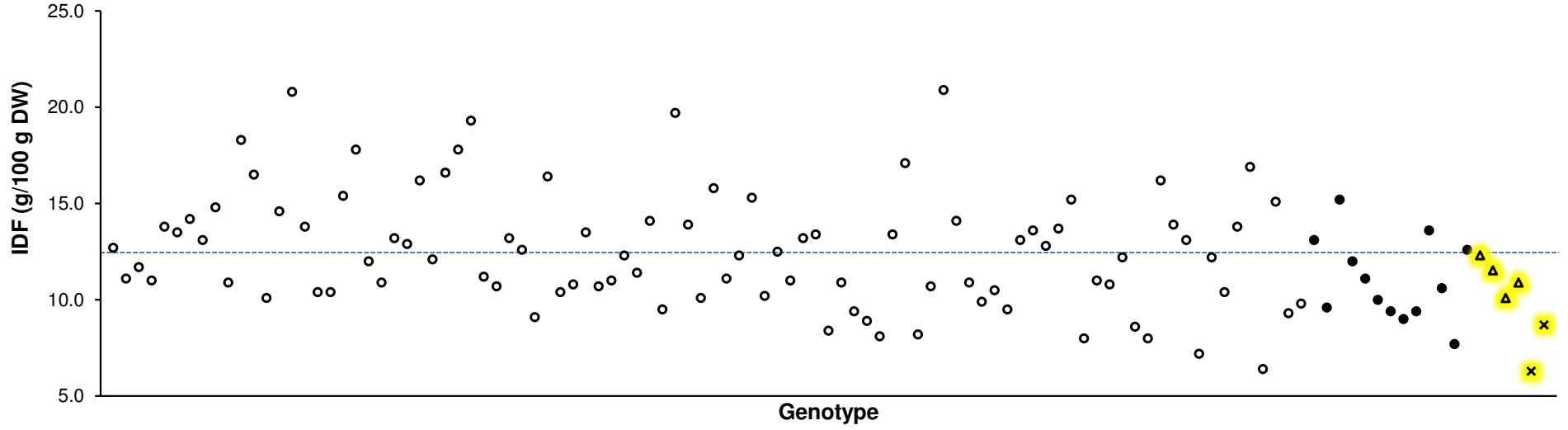

Recommended nutrient intake (RNI) per day for people aged from 19 to 50 years old: 13.7/29.4 (male/female) mg of iron with 10% bioavailability*

**%DV = 231 g potato FW x iron content (mg /100 g FW) x 100 / RNI (mg)**

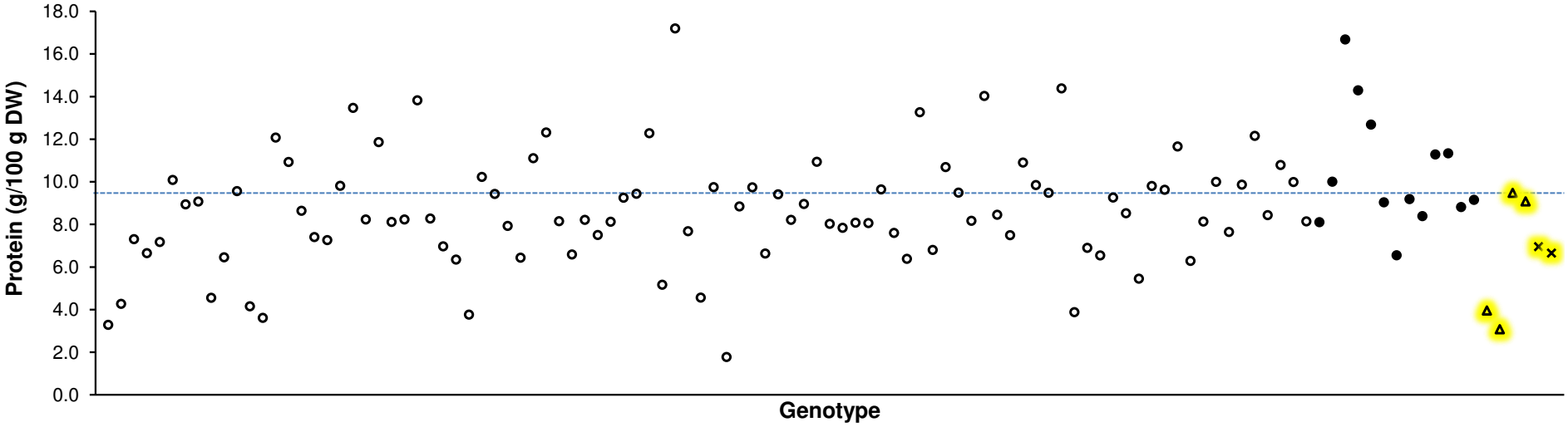
*FAO/WHO (2001); USDA (2002)

# Up to 1.5/1.7 more soluble/insoluble dietary fibre in the collection than in the commercial cultivars

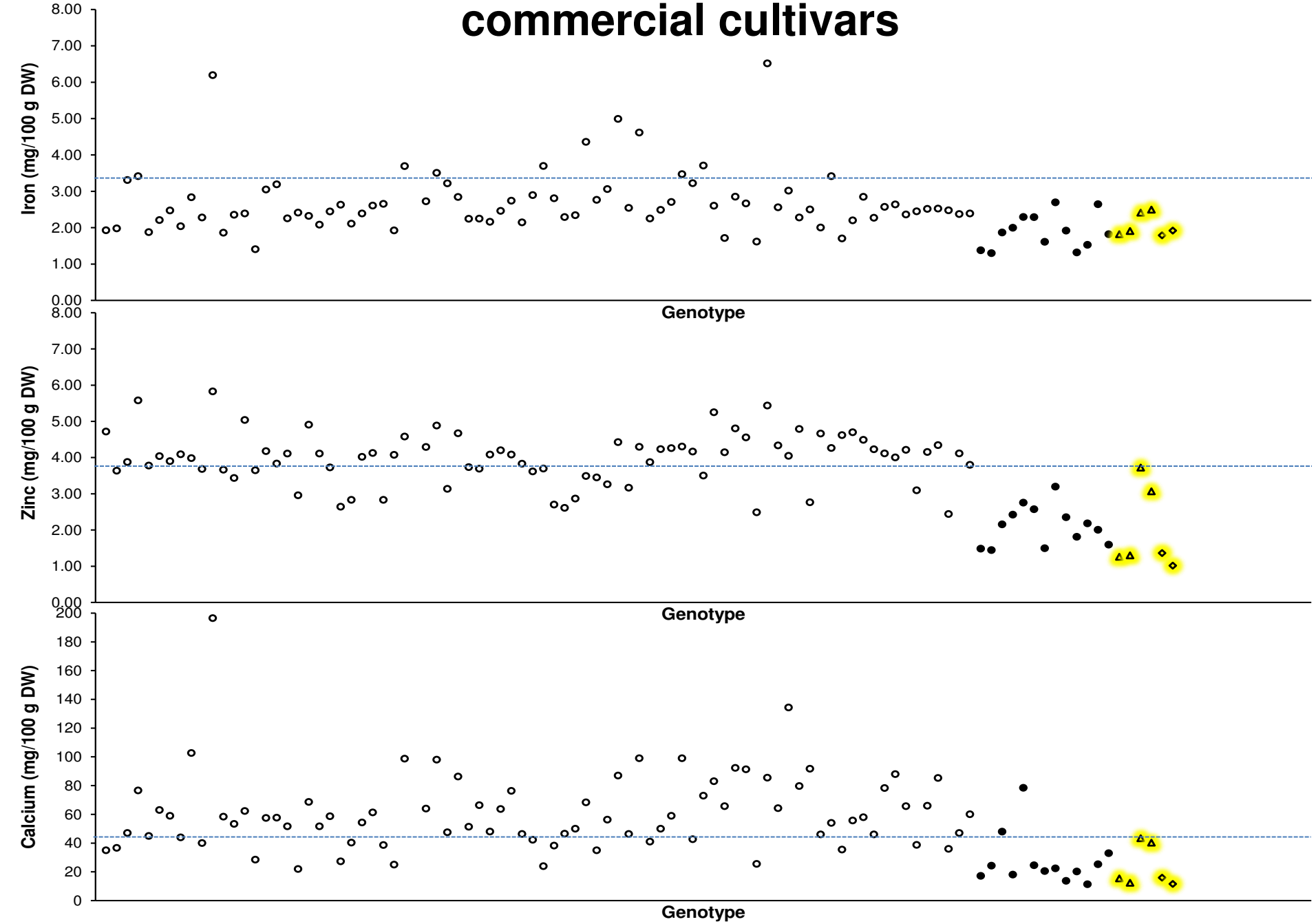


# Up to 1.8 more protein in the collection than in the commercial cultivars



# Up to 2.6/1.6/4.5 more Fe/Zn/Ca in the collection than in the commercial cultivars



# Conclusion

Advanced clones > Commercial cultivars




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Colombian Core Colection



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Journal of Chromatography B

journal homepage: www.elsevier.com/locate/chromb

# Development and validation of a liquid chromatographic method to quantify sucrose, glucose, and fructose in tubers of *Solanum tuberosum* Group Phureja

Diana Duarte-Delgado[a], Carlos-Eduardo Narváez-Cuenca[b], Luz-Patricia Restrepo-Sánchez[b], Ajjamada Kushalappa[c], Teresa Mosquera-Vásquez[a,*]

LWT - Food Science and Technology 62 (2015) 76–82

Contents lists available at ScienceDirect

LWT - Food Science and Technology

journal homepage: www.elsevier.com/locate/lwt

# Nutritional contents of advanced breeding clones of *Solanum tuberosum* group Phureja

Clara Peña [a], Luz-Patricia Restrepo-Sánchez [a], Ajjamada Kushalappa [b], Luis-Ernesto Rodríguez-Molano [c], Teresa Mosquera [c], Carlos-Eduardo Narváez-Cuenca [a, *]