UNIVERSIDAD NACIONAL DE COLOMBIA SEDE BOGOTÁ

Fundesurco Nariño
FUNDACIÓN PRO DEL SURCO NARIÑO

McGill

Improving potato production for increased food security of indigenous communities in Colombia

Assessment of nutritional composition *Solanum tuberosum* group Phureja grown in the department of Nariño

Luz Patricia Restrepo

IDRC CRDI Project supported by **International Development Research Centre -** www.idrc.ca

Canada

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Third parties

UNB FREDERICTON

CENTRO INTERNACIONAL DE LA PAPA CIP

Collaborators

Universidad de Nariño

Nariño

Alcaldías municipales:

- Carlosama
- Cumbal
- Guachucal
- Pasto
- Túquerres

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Assessment of nutritional composition *Solanum tuberosum* group Phureja grown in the department of Nariño

Students: ALEJANDRA ALBA
MSc. Ciencias Agrarias

CLARA BIANETH PEÑA
MSc. Ciencia y Tecnología de Alimentos

CLARA PIÑEROS
PhD. Ciencias Agrarias

DIANA LUCIA DUARTE
MSc. Ciencias Agrarias

Advisor : LUZ PATRICIA RESTREPO S.
Associate Professor

Nutritional composition

código FAO: **B620**

Nombre corto:	Papa, criolla, con cáscara				
Agua (g)	75.50	**Ácidos grasos saturados (g)**		**Hierro (mg)**	0.60
Proteínas (g)	2.50	**Ácidos grasos monoinsaturados (g)**		**Zinc (mg)**	
Grasas (g)	0.10	**Ácidos grasos poliinsaturados (g)**		**Vitamina A equiv. totales (µg)**	6.00
Cenizas (g)	1.00	**Colesterol (mg)**		**β-caroteno equiv. totales (µg)**	
Fibra dietética (g)		**Sodio (mg)**		**Tiamina (mg)**	0.08
Carbohifratos totales (g)	20.90	**Potasio (mg)**		**Riboflavina (mg)**	0.06
Carbohidratos disponibles (g)		**Calcio (mg)**	7.00	**Niacina (mg)**	2.50
Energía (kcal)	95.00	**Fósforo (mg)**	54.00	**Vitamina C (mg)**	15.00

Fuente: Tabla de Composición de Alimentos Colombianos, 2008

General objective

To evaluate the nutritional composition of *Solanum tuberosum* group Phureja located in Nariño.

Specific objectives

- To develop the methodology required to assess the nutrient content of different potato group Phureja .

- To evaluate proximal analysis of 202 clones of *Solanum tuberosum,* group Phureja.

- To dertermine content of iron, phosphorus, potassium, magnesium, aluminum, calcium and zinc in colombian landraces potato Phureja.

Specific objectives

- Determine the total and individual antioxidant compounds: phenolics compounds, carotenoids, anthocyanins and ascorbic acid in cultivars of *S. tuberosum* commonly used in the region of Nariño (Colombia).

- Asses the content of glycoalkaloids in *S. tuberosum* group Phureja.

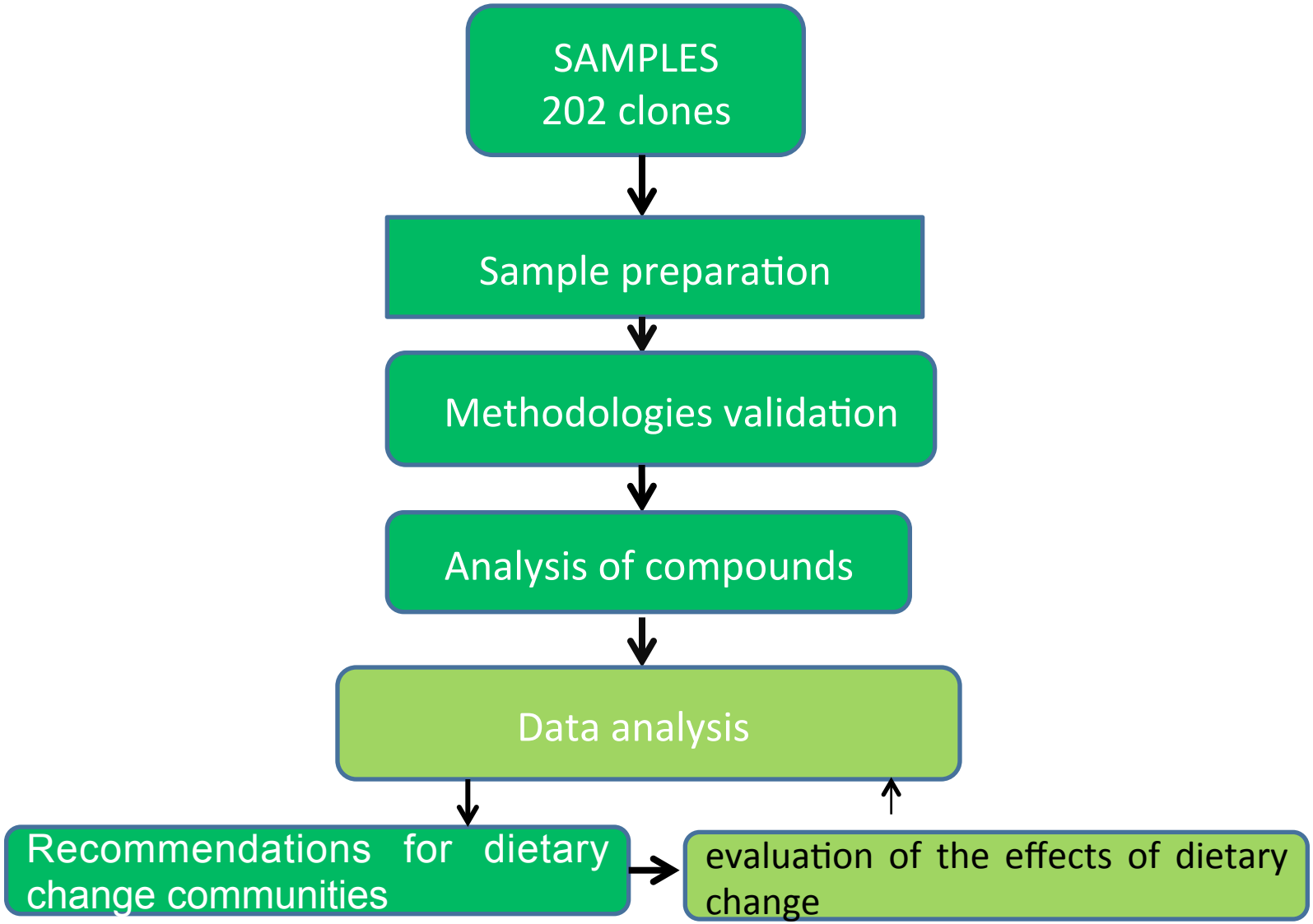
- Identify clones of *Solanum tuberosum* group Phureja with better nutrient content to be recommended for consumption by indigenous communities in the department of Nariño.

Hypothesis

Which is the nutritional composition of native potato clones (*Solanum tuberusum* group Phureja) existing in the Department of Nariño?

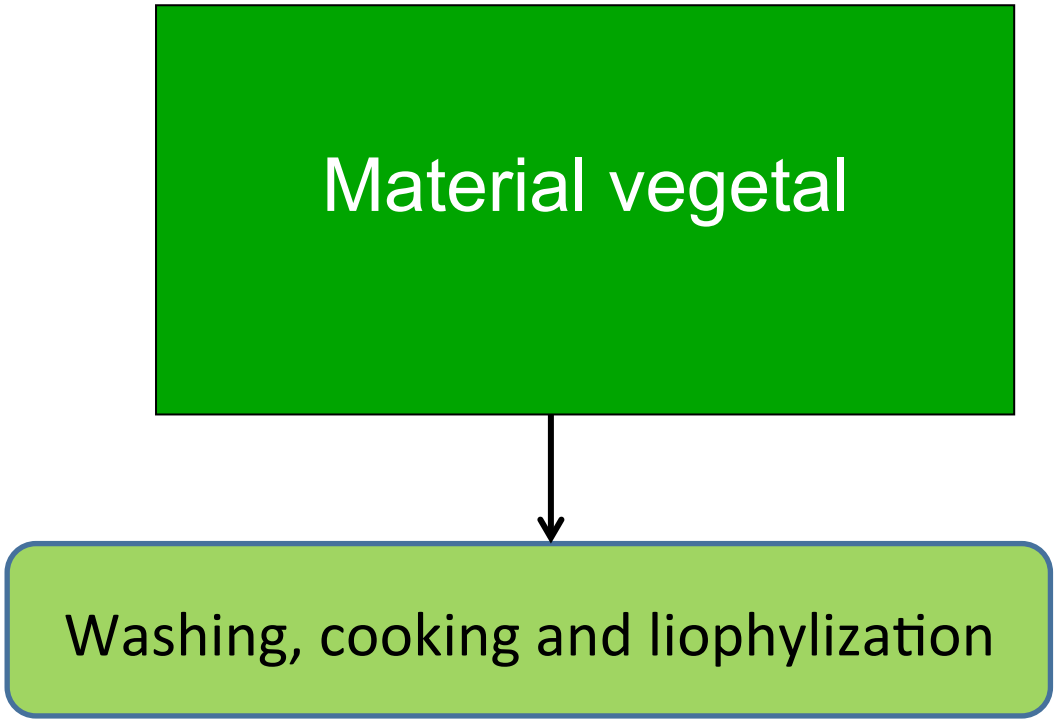
Which are the clones that may have better nutritional impact to be recommended for consumption diet of indigenous communities in the department of Nariño?

METHODOLOGY



Methodology

Samples:



Validation of methodologies: USP, 2002, p. 2256-2260

For each component:

Sensitivity
Precision
Exactitude
Repeatability
Reproducibility
Linearity

Analysis of compounds

Proximate analysis:

Humidity: Stove Vacuum, A.O.A.C 931.04
Ash: A.O.A.C 972.15
Fat: Goldfish method, A.O.A.C 963.15
Protein: microkjeldahl method, A.O.A.C 970.22
Dietary fiber: Enzymatic-gravimetric , Prosky method, AOAC 993.21/90.
Micronutrient content: atomic absorption (Fe, P, K, Mg, Al,Ca and Zn) in ash. A.O.A.C: 3111B.

Analysis of compounds

Analysis of starch:

METHOD A.O.A.C. 996.11

1. amylose
2. amylopectin
3. resistant starch

Analysis of compounds

Analysis of antioxidant compounds:

Phenols: methanol extraction
Analysis by HPLC (Reverse Phase, C18)

Carotenoids: liquid-liquid extraction (acetone-ether).
Analysis by HPLC (reversed phase C30).

Anthocyanins: methanol extraction
Analysis by HPLC (reverse Phase, C18)

Ascorbic acid: aqueous extraction
Analysis by HPLC (normal phase)

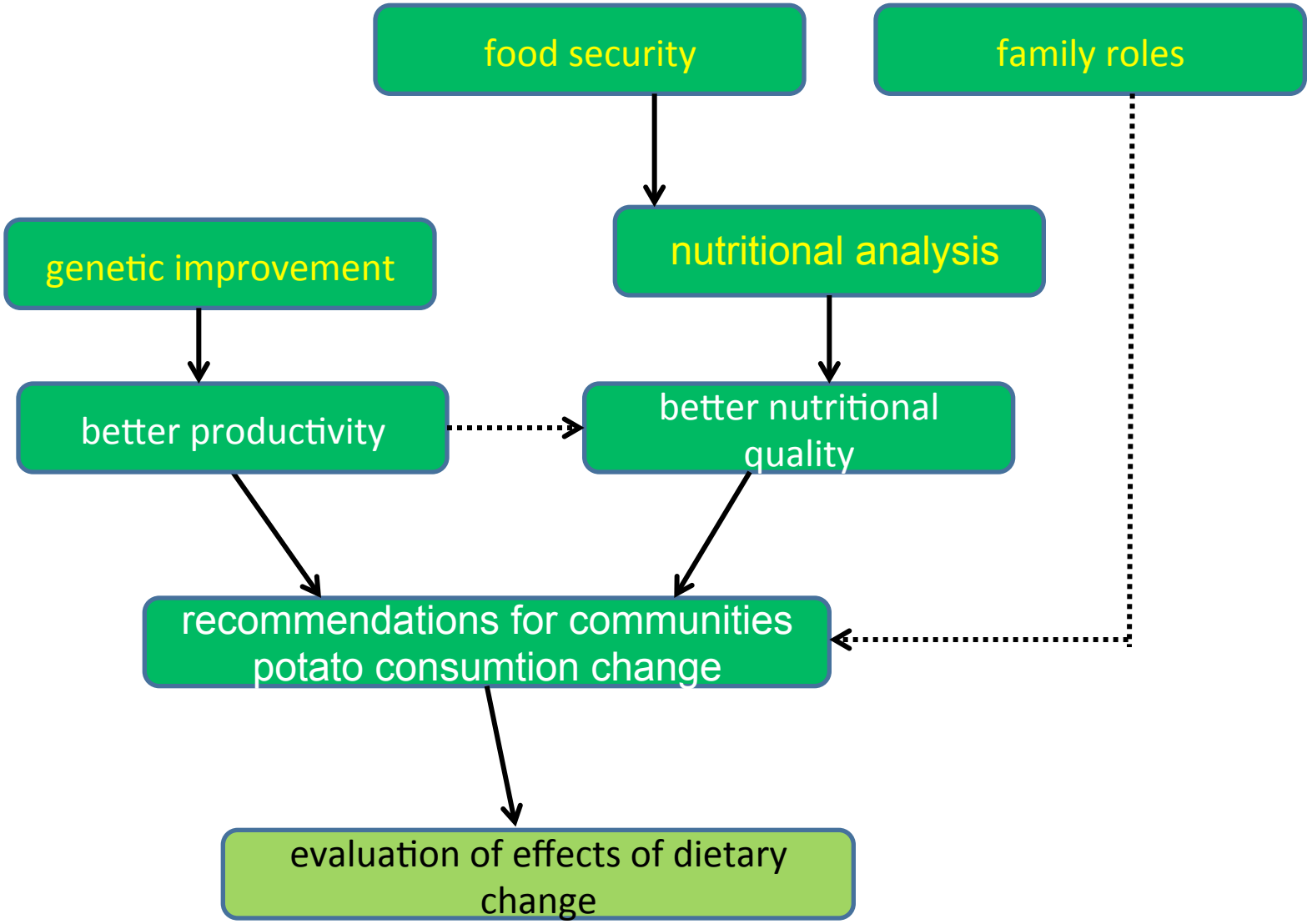
Antinutritional compounds:

Glycoalkaloids: solid-liquid extraction (C18, acetonitrile)
Analysis by HPLC (Reverse Phase, C18)

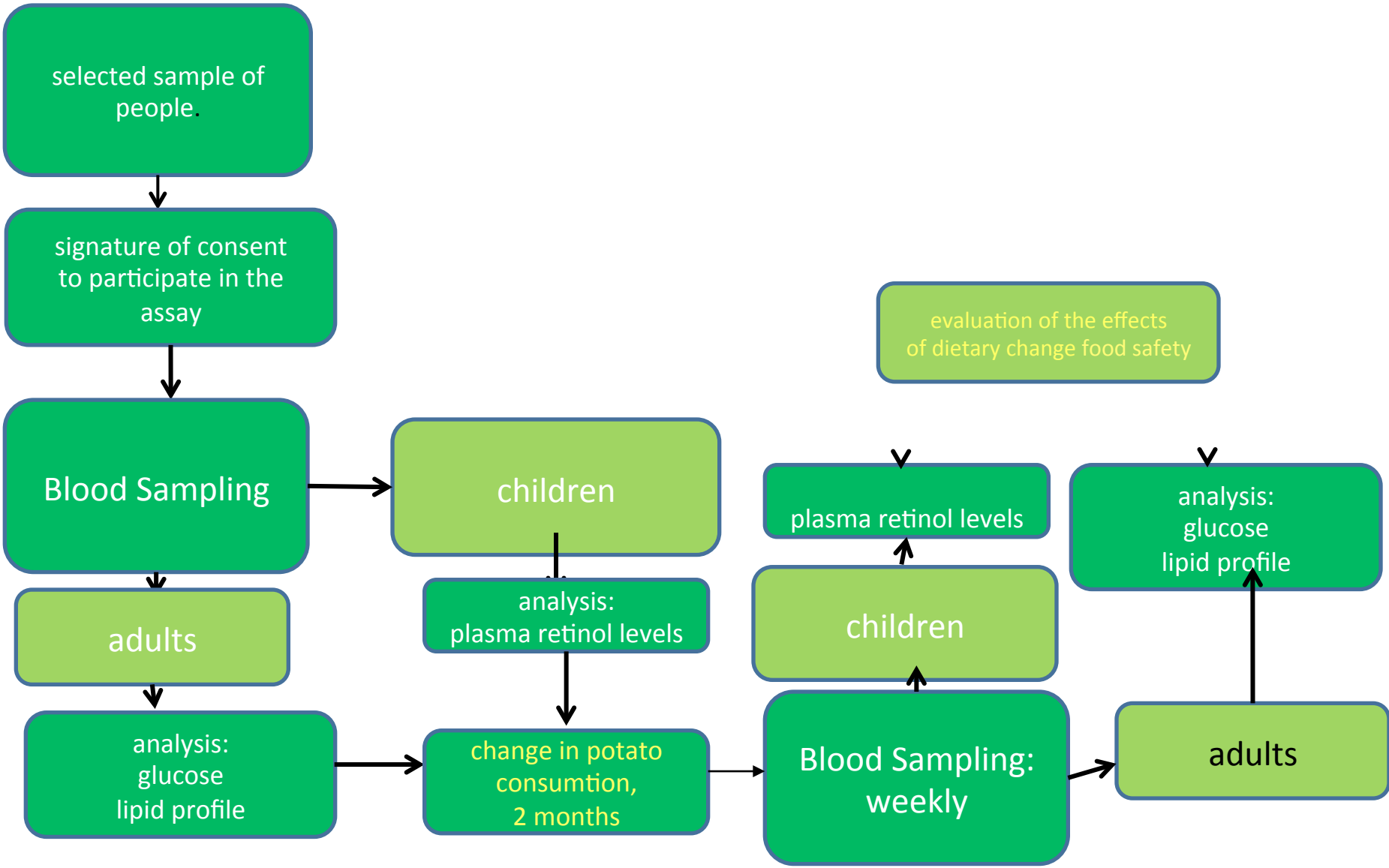
Analysis of results

Determining the difference of the contents of each nutrient in clones: ANOVA

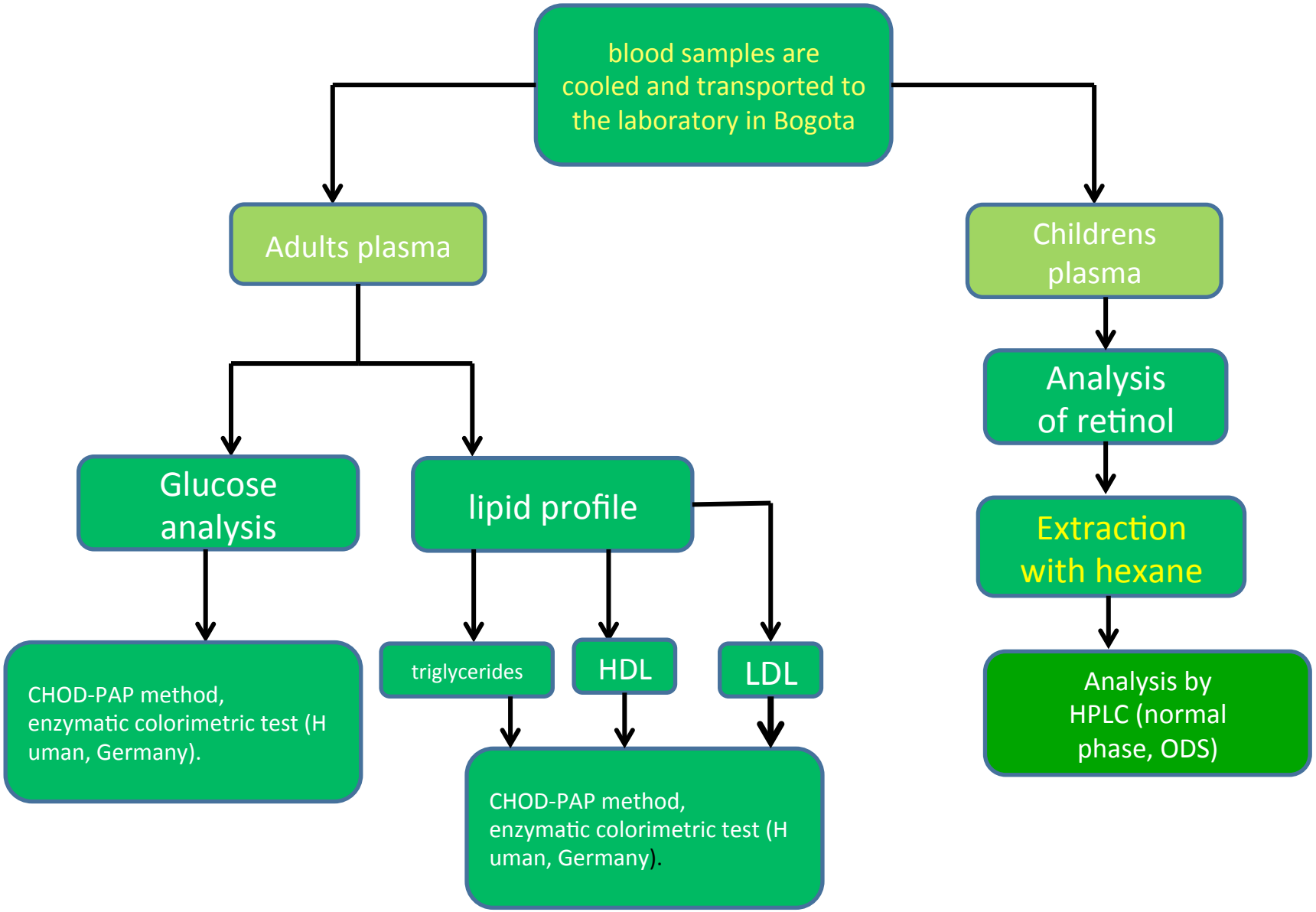
Nutritional classification of the clones: multivariate analysis


food security
family roles
genetic improvement
nutritional analysis
better productivity
better nutritional quality
recommendations for communities potato consumtion change
evaluation of effects of dietary change

evaluation of the effects of dietary changefood safety:



Analyze of metabolites in blood



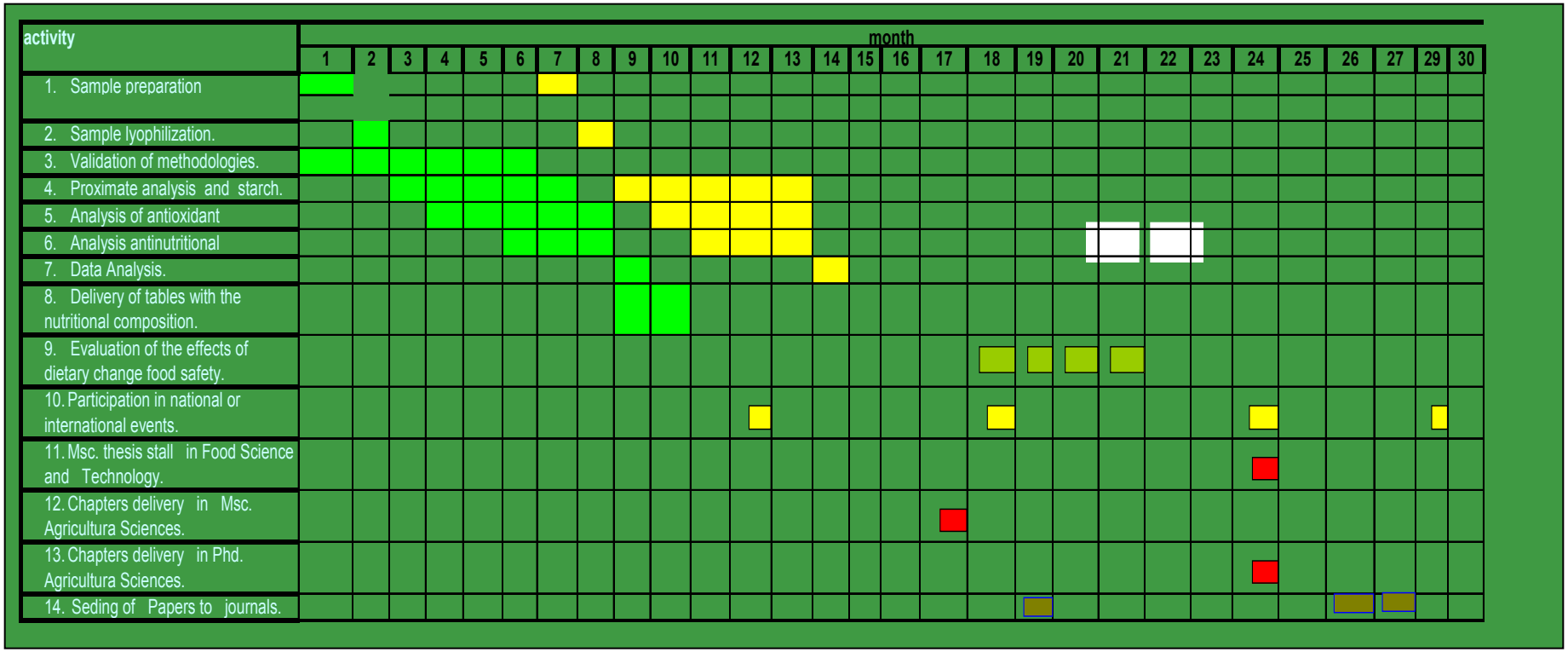
MILESTONES

- Tables with the nutritional composition (moisture, ash, fat, protein, dietary fiber and starch), micronutrients, antioxidant compounds and glycoalkaloids for each clone of potato (Solanum tuberosum group Phureja). Results that will be delivered to the ICBF sectional Nariño to be involved in: “Tabla de Composiciòn de Alimentos Colombianos”.
- Differentiation in the nutritional composition between the native potato clones evaluated.
- Selection of cultivars with better nutrient content.
- Effect of nutritional change in glucose and triglyceride levels of adults and vitamin A in children

ACADEMIC PRODUCTS

- Participation in 5 symposiums, national or international events (Andean).
- Publication of at least 3 papers in journals.
- 1 MSc. Thesis in Food Science and Technology.
- Development of part of the chapters on methodology and results of a master's thesis in Agricultural Sciences and a PhD in Agricultural Sciences.

Schedule



symbol	Sources
	indigenous communities cultivars of Nariño department
	Central Colombian CollectionCCC-UN.

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•Villa, A. y Sanchez, A. et al.2007Evaluación preliminar de técnicas de crioconservación en una accesión de *Solanum Revista Corpoica – Ciencia y Tecnología Agropecuaria.* 8(2) Bogotá, pp 50-59. http://www.corpoica.org.co/sitioweb/Archivos/Revista/7.Evaluacinpreliminardetcnicas.pdf.

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