“Validation of safety control measures and pathogen reduction steps for the safe production of traditional artisanal dairy products from the Mesoamerican region.”
1. Lacking regulations and control in the region (dairy safety).

2. 40% of the dairy products are produced by artisan processors in small-medium scale facilities.

2. Dairy products, particularly cheeses, have caused numerous foodborne outbreaks in Mesoamerica.

3. Limited information regarding the formulation and processing of traditional dairy products is available in the region.

1. Deficient application of Good Manufacturing Practices and safety control measures (pasteurization, cold storage).

2. Producers relay in dry salting, mild heat treatments and mild acidification for safety assurance but these control measures have not been scientifically validated yet.

3. Limited education materials, in Spanish, are available.
**Execution unit:** National Research Center of Food Science and Technology (CITA), University of Costa Rica.

**Research team:**
PhD. Jessie Usaga (Coordinator)
PhD. Eric Wong
Bach. Diana Viquez
4 undergraduate students (Food Science Department, UCR)

**Funding:** Platform for International Partnerships (ILSI)

**Duration:** 3 years (august 2016-2019)

**Components:** Research, teaching and extension.
1. Scientific evidence regarding the efficacy of the current practices followed by artisans to produce highly consumed traditional dairy products in Mesoamerica.

2. Technical recommendations (formulations and processing conditions) required to safely produce highly consumed traditional Mesoamerican dairy products.

3. Education materials developed, in Spanish, to provide training and technical assistance to artisan producers of dairy products in Mesoamerica.

4. At least 4 students performing their research (graduation requirement).
1. Select common dairy products produced by artisan processors and that are highly consumed in the Mesoamerican region.

**PROJECT STAGES**

**DRY SALTING**
Costa Rica: Bagaces Cheese
Similar products are produced in the region

**MILD ACIDIFICATION + HEATING**
Costa Rica: Queso palmito o arrollado
Nicaragua: Quesillo
Guatemala: Quesillo
Honduras: Quesillo
El Salvador: Quesillo
República Dominicana: Queso de hoja
Colombia*: Queso pera
Ecuador: Queso de hoja
Venezuela*: Queso telita

**FERMENTED MILK**
2. Products characterization: formulation and processing.

At least 5 different artisan producers, of each product and from different parts of the country, were visited by the students to determine the formulation and processing conditions followed. Good Manufacturing Practices were audited.

Samples were taken, at least three different batches, to determine the products' physicochemical properties and microbiological profile. The presence of generic E. coli, Salmonella enterica, Listeria monocytogenes and S. aureus was tested.

Once the products were characterized, formulations and processing conditions will be standarized at the pilot plant level in the University of Costa Rica.
4. Validation of the current safety control measures. Literature review, microbial challenge studies, kinetics of acidification temperature, water activity, etc.

![Figure 1](image1.png)

**Figure 1.** Kinetics of acidification at 25°C during the production of “queso palmito”

![Figure 2](image2.png)

**Figure 2.** Heating and cooling kinetics during the production of “queso palmito”
5. Development of educational materials to provide teaching and extension to producers, informative material for consumers (videos) and organization of at least 4 training workshops to share results.
Thank you!