

## This study investigates the cost of increasing dietary diversity for livestock producers who minimize the cost of supplying nutrients to animals.

**Project Title:** P787 - Livestock and fish production, consumption of animal-sourced foods, and climate change to 2050

**Description of the innovation:** We have investigated the cost of increasing dietary diversity for livestock producers who minimize the cost of supplying nutrients to animals, a problem comparable to the "diet problem". Although researchers have extensively studied the benefits of diversity, the explicit cost of diversity remains understudied. Our approach combines a nonlinear programming model and a cross-entropy measure using an index for diversity that incorporates observed commodity mixes and a uniform prior based on information theory.

**New Innovation:** No

**Stage of innovation:** Stage 1: discovery/proof of concept (PC - end of research phase)

**Innovation type:** Social Science

**Geographic Scope:** Global

**Number of individual improved lines/varieties:** <Not Applicable>

**Description of Stage reached:** We illustrate the technical aspects of the new livestock module of the IMPACT model, while also presenting initial results across different geographies.

**Name of lead organization/entity to take innovation to this stage:** IFPRI - International Food Policy Research Institute

**Names of top five contributing organizations/entities to this stage:**

- CSIRO - Commonwealth Scientific and Industrial Research Organisation
- ILRI - International Livestock Research Institute

**Milestones:** No milestones associated

**Sub-IDOs:**

**Contributing Centers/PPA partners:**

**Evidence link:**

- <https://tinyurl.com/ya4fhsuo>

**Deliverables associated:**

- D5760 - Long-term simulation of the livestock sector through the IMPACT model (<http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/133026>)

**Contributing CRPs/Platforms:**

- CCAFS - Climate Change, Agriculture and Food Security
- PIM - Policies, Institutions, and Markets