Optimizing Profitability in an Agroecological System
By: Haley Birch and Project Advisor, Eric Smith, Supply Chain Lecturer at Iowa State

Background
The demand for increased food production is growing along with the population. The proper utilization of land is key for food security. There is a disconnection between standard farming techniques and natural eco-systems. Land and livestock have opportunities to yield higher profits from working with the eco-system through agroecological farming (Undersander, Albert, Cosgrove, Johnson, and Peterson 2002). Improving agroecological practices among farmers is a step towards decreasing our footprint, and living sustainably.

Methodology
• The scope of the research is focused on Simple Life Farms, a family farm in Winterset, Iowa that raises dairy goats and chickens
• Collected profitability, land, and animal information from Project Advisor on current farming operations; visited the farm
• Gathered scholarly and online research on agrological farming techniques
• Compiled primary and secondary research to identify the potential profits for various farming operations

Focus
The direction of the research was focused on one main question: What is the optimal mix and quantity of animals based on profitability and sustainability?

Results
• A multivariate spreadsheet that calculates maximum profit per animal based on
  • Land available
  • Sustainable stocking rates of animals per acre
  • Estimated profit per animal
• A research paper that outlines
  • Current farming operations
  • Potential farming operations
  • Sustainable animal stocking rates
  • Land management techniques including: foraging, rotational grazing, and fertilization/seeding

Conclusions
• Dairy goat products are the most profitable enterprise
• There is an opportunity to have chickens follow sheep or goats in pasture rotation;
• Planting a variety of grasses will increase the % of pastured diet for livestock