Local Production of Quality Affordable Feed

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Summary

Availability of safe low-cost poultry feed is a prerequisite for enterprise profitability and growth. Efficient feeding systems promote high productivity and reasonable profits despite feed generally comprising about 70% of conventional production costs. In the same way, lack of affordable and adequate feed prevents small-scale farmers from expanding their operations. This raises the possibility of producing lower cost feeds from locally available and seasonal materials. Local energy and protein ingredients may be blended and combined with purchased additives, into formulated feeds for different development stages of birds. Costs of feed can further be reduced by free ranging, use local by-products and edible leaves. Proven technologies exist to combine these diverse feed sources into systems that improve local supplies of meat and eggs and generate additional profits for local producers.

Technical Description

The purpose of locally blended feeding is to select the right combination of feeds for a balanced ration while at the same time reducing dependence on more expensive purchased feeds. Energy, protein, minerals and vitamins are required in different proportions by chickens depending on their age and level of production. Feeds falling below a critical threshold of crude protein (about 20%) impede weight gain or egg production. A simple blended feed consists of 50% maize or wheat, 21% soybeans, 14% bran, 8% oil press cake (e.g., groundnut, palm, sunflower), 2% fish and bone meal, 1.5% fortified “premix” (poultry supplement), 1% limestone and 0.5% salt. Feed formulations are further ground into mash for chicks or pelleted for larger birds. This formulation illustrates the importance of increased cereals, soybean and cooking oil production. This basic blended feed can be supplemented with other locally available or seasonal ingredients.

Uses

There is a broad range of feeds with different formulations recommended for broilers (for meat) and layers (for eggs), and chicks are provided mash rather than pellets. Inexpensive options for feeding chickens include use of kitchen wastes, fodder from free-range practice, and provision of green leaves and insects, although some of these sources are difficult to scale.

Composition

Maggots are a rich source of proteins for chickens but less available than green materials. Chickens may be fed on whole or crushed grains, including broken and off-grade cereals but care must be taken to assure that the grains are not contaminated with mycotoxins. Sprouting grains increases their vitamin contents and digestibility and may be scaled through hydroponic culture. Note that improperly stored grains and household wastes are susceptible to rot that negatively affect the health and growth of chickens. The use of dried, milled cassava peels is increasingly recognized as an alternative energy ingredient.

Means of application

Traditional poultry producers have long fed locally available feed materials to chickens in household production systems, and the challenge is how best scale up this knowledge. Sprouted grains are produced by soaking seeds in in water for one to two days and then placing them in shallow trays to germinate for about seven days. The by-products of grains from milling are also suitable for poultry. Maggots can be produced by mixing fresh animal manure with dry straw in a large basin, attracting flies. This technology is scaled through production of confined Black Soldier Flies that feed upon the peels and wastes of fruit.

Agroecologies	All Agroecologies.
Regions	Africa South of Sahara.
Developed in Countries	Zimbabwe, Zambia, Uganda, Tanzania, South Sudan, Somalia, Sierra Leone, Senegal, Rwanda, Nigeria, Niger, Mozambique, Malawi, Madagascar, Kenya, Ivory Coast, Guinea, Ghana, Gabon, Ethiopia, Democratic Republic of the Congo, Central African Republic, Burundi, Botswana, Benin.
Available in	Zimbabwe, Zambia, Uganda, Tanzania, South Sudan, Somalia, Sierra Leone, Senegal, Rwanda, Nigeria, Niger, Mozambique, Malawi, Madagascar, Kenya, Ivory Coast, Guinea, Ghana, Gabon, Ethiopia, Democratic Republic of the Congo, Central African Republic, Burundi, Botswana, Benin.
Solution Forms	Input Supply.
Solution Applications	Livestock Production, Feed/Fodder Production.
Agricultural Commodities	Poultry.

Target Beneficiaries	Agro-dealers, Commercial farmers, Small-scale farmers.

Commercialization

Commercialization Category

Commercially available

Startup Requirements

Formulating poultry feed involves understanding of: 1) Nutrient requirements for the type of flock, e.g., egg layers, meat chicken and breeders, 2) Composition of feed ingredients and constraints in terms of nutrition and processing, and 3) Cost and availability of ingredients.

Production Costs

The costs of feed production depend upon the projected level of production and the available ingredients and costs. A machine that grinds, mixes and pellets 1 ton of poultry feed per hour costs about US $36,000 in Nairobi. Larger units process up to 5 tons per hour and produce pellets of different sizes ranging from 2.5 mm to 4 mm. Mixers, mills and petting machines purchased separately that can process and bag 100 to 200 kg feed per hour cost about US $3,000.

Customer Segmentation

The manufacturing of fish feed pellets with locally sourced ingredients and automated equipment is relevant for privately owned or community-based enterprises. Companies that supply, engineer, and build feed production lines need to maintain close contacts with local producers, distributors, and government agencies for delivering services that match market conditions.

Potential Profitability

In Malawi, use of local ingredients at a commercial scale reduced the cost of feed from US $482 to $270 per ton. Mash from transformed cassava peels is only 50% the cost of grain and can replace 20% of the maize used in growers ration and 35% of the maize for layers mash.

Licensing Requirements

There are no licensing requirements for operating a local, low-cost feed production, however, once commercialized feed producers are subject to a suite of standards and regulations intended to ensure the quality and safety of their products.

Innovation as Public Good

The solution is a regional public good disseminated by the International Livestock Research Institute.

Solution Images



Different types of composite feed for varying stages of development



A horizontal mixer (top), mill (left) and pellet machine (right) used in small-scale feed production



Un poulet se nourrissant d'asticots riches en protéines

Institutions

ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

Accompanying Solutions

Cassava Peels for Animal Feed Production