



Las Cañadas Agro-ecological Chickens Module

by Tania de Alba Rodríguez

I live in Las Cañadas (www.bosquedeniebla.com.mx), an education center for sustainable living. For 20 years, we at Las Cañadas have been dedicated to conservation of the rain forest, one of the scarce and biodiverse forests that exist. We are also committed to finding and demonstrating ways to live a simple and ecologically viable life.

Along with preserving the forest, we produce a large part of our food in an agro-ecological way—that is to say, in a manner that takes care of the soil, water and ecosystem in which we live.

I grew up in the city, so the experience of getting close to cultivating what we eat has been a lot of learning, since generally that environment is not connected with the efforts involved in the production of our food and much less with the implications of industrial production.

Our center is managed by a cooperative and is organized around production modules, such as farming, dairy, bamboo, and others, that try to meet dietary needs with eggs, milk and plant-based foods. We occasionally eat meat during times of celebration. This article describes our module for egg production.

From the start, we knew we wanted chickens to be a part of our center. In our country, egg consumption is an important part of rural life. Eggs offer protein of excellent quality for those who cannot or do not want to consume other products of animal origin. Raising chickens ourselves would mean we could consume antibiotic-free eggs from happy hens. We built a small hen house and purchased chickens from people in surrounding communities. We kept the chickens in the hen house for the night, fed them whole corn in the mornings, and let them loose during the day. We waited for them to produce eggs...

...except, they did not! Yes, the hens were free and "happy"—but they laid eggs when they wanted and where they wanted; they



Figure 1. Chickens grazing in the field.
Source: Gerardo Sánchez Vigil

were eaten by predators; they suddenly became sick and died; and we did not know for how long they would lay eggs. Since we still ended up buying eggs despite having chickens, we decided to learn how to care for them so that they would be healthy and free but also productive. Below I cover the six most important lessons that have allowed me to keep my henhouse healthy and productive.

First: Few hens in enough space. Good animal husbandry requires knowledge of animals' nature and behavior. Hens like to walk and scrape all day, they frequently groom themselves, they bathe in the loose earth, they need shelter from the sun, they sleep on trees, and, although they prefer to live in groups, they require enough space to not be stressed. Hens will naturally peck others' combs to establish hierarchy in the chicken coop, but under conditions of stress caused by overcrowding, this same behavior can lead to cannibalism. Since predators like to eat our birds, we cannot allow them to be totally free, but they are able to "graze" in fenced-in pastures. (See Table 1 for details).

No. of animals	40 laying chickens and 4 roosters
Variety	Improved Criollas
% average production per year	50%

Second: A well-equipped chicken coop appropriate to the number of hens.

Although hens like to go out and sleep on trees if possible, they benefit from a well-equipped henhouse that provides protection from predators, comfortable sleepers, access to clean food in feeders, and warm nests with straw to lay their eggs. Provide enough henhouses and equipment to avoid stressing the hens. Layer dry material on the floor of the henhouse, to help keep it dry and to manage waste. Extreme temperatures affect hens negatively, so if possible, control the temperature by ventilating the henhouse when it is hot and covering it when it is cold. (See Table 2 for details).

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Honoring God by empowering the undernourished with sustainable hunger solutions.

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Henhouse	25 m ²
Pastures	3 rotational pastures/ 3m ² per bird
Nests	1 for every 5 chickens
Perch	25cm linear per bird
Eateries	3 eateries (1 per 15 bird)
Water dispensers	1 with 4 lids (1 lid per 10 birds)

Third: Improved “criollitas” (local) chicken varieties serve different purposes: layers (for eggs); dual purpose (for eggs and meat); meat birds; and creoles. In Las Cañadas we have creoles, which are hens of different colors and characteristics; because of their genetic diversity, they thrive in a variety of conditions. These “Criollitas” are not as productive as layers, but we have discovered that with good management they increase the number of eggs they lay. Thanks to their genetic diversity, during the 10 years that I have raised chickens, no illness has devastated the chicken coop. We do have to deal with the fact that our hens always want to have chicks, which means managing the “broody hens” so they do not stop laying eggs. When hens are brooding but it is not the proper season to raise chicks, I lock them in a cage for three days and they finally give up brooding. Our “Criollitas” have been improved and made more productive as we have raised our own birds adapted to the conditions of the place. We put one double-purpose rooster in the henhouse for every ten hens, to secure fertile eggs.

Fourth (and most important): A good diet. Chickens like to eat anything, but they love grains and insects. To receive good service from them, we have to give them a balanced diet; this will help them start laying eggs at five or six months of age. Sunlight stimulates a hen to produce eggs, but the process requires carbohydrates, protein,

vitamins and minerals. Our hens eat homemade feed made from organic grains grown on the ranch. This feed contains corn, soy or canavalia (depending on what was most recently cultivated), calcium carbonate, burnt and ground bone, and salt (see Table 3). Every day they each receive 100g of feed, plus fresh forage: nacedero (*Trichanthera gigantean*), ramio (*Bohemian nivea*), comfrey (*Symphytum officinale*), cow tongue (*Opuntia engelmannij var. linguiformis*), and clean water. The hens are able to eat insects from the paddocks and compost.

Ingredients	% of the diet	Quantities in 10 kg of feed
Maize	60%	6 kg
Canavalia	20%	2 kg
Wholemeal Soy	10%	1 kg
Calcium Carbonate or Egg Shell	5%	500 g
Burned and ground bone	4.5%	450 g
Salt	0.5%	50 g

Fifth: Achieve animal welfare and hygiene of the chicken coop. In production systems, human intervention is most important. How we manage and treat the hens will largely determine what we get from them. A sustainable system must include attention to animal welfare. Hens like gentle and routine treatment; sudden movements frighten them. Because they are susceptible to infectious diseases, the henhouse must be cleaned frequently, to keep the “bed” free of smells and stuck excreta, and to keep the inside of the henhouse ventilated, dry and light. We have found it helpful to give specific supplements during seasonal changes. We put a teaspoon of aloe in the water in the summer and a clove of garlic in the winter to help prevent digestive and respiratory

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problems. A teaspoon of homemade apple cider vinegar added to the water during stressful situations can help prevent and even heal. Deworming with epazote (a.k.a. Mexican tea, *Dysphania ambrosioides*) in March and October has kept us from using medications. We cull our chickens every year and we do not keep individual birds for more than two production cycles, which helps to maintain stable production, allows the cocks to develop better, and helps avoid diseases. We breed our own birds, because we have seen that sometimes bringing chickens from the outside invites diseases.

Sixth: Observe and maintain production and financial records. In order to share the experience with others and to know how the hens’ production and care can be improved, we must keep records of how many eggs hens lay, at what age they start producing, our costs, how much we need to feed them, what we produce, how the hens behave during the year, which are the best hens, etc.

In addition to yielding these six lessons, maintaining an egg production system based on agro-ecological principles has led to reflection on a number of questions: What is the appropriate scale for an agro-ecological production project? What ecological and social repercussions does the great consumption of animal protein have on our society? Is it realistic and possible to ask a system that produces healthy food to also generate enough money to be a business? Could it be that less is more? Can small be beautiful and sustainable?

The answers to those questions are not easy to come by. But raising chickens has helped me understand the natural cycles of life, and has offered me opportunities to intervene in these cycles in an efficient and respectful manner.

Introducing Cecilia Gonzalez: Team Leader, Central America/Caribbean Region

Cecilia was born and raised in Quito, Ecuador. She spent half of her life in other countries, including Honduras, Haiti, and the United States, pursuing her call to relieve hunger in the world. Before moving to Florida, Cecilia served with World Relief for a year in Haiti and later in their office in Baltimore supporting their earthquake rehabilitation programs. She has also served with Catholic Relief Services, Mercy

Ships, and the Ithaca Pregnancy Center. After transferring from the Agro-industrial Engineering Program at the Pan-American Agriculture University “Zamorano” in Honduras, Cecilia obtained a BS in Food Science from the University of Arkansas, Fayetteville. As a graduate student at Cornell University, Cecilia focused on international development and did research on iron nutrition.



Tech Note Spotlight: "Cafeteria Feeding" of Chickens

Summary by Libby Arcia

ECHO regularly publishes agriculture technical notes to address important agriculture development issues. Here is a short excerpt from a tech note on "Cafeteria Feeding" of Chickens. It is available at ECHOCommunity.org in English and in Spanish.

"Cafeteria Feeding" of Chickens

George Peckham, who until his recent passing, had been a volunteer at ECHO for years after retiring from a career working with poultry feeds and production in various locations in Latin America. We are honored to share with you one of his many contributions to ECHO's body of knowledge.

Chickens are an important source of meat and eggs for many small-scale farmers. When only a few chickens are raised meeting their dietary needs is relatively easy. However, there is a challenge when increasing the flock size.

The solution to this problem might be "cafeteria feeding." This system requires rethinking of feeds and some re-tooling.

By serving ingredients which are not mixed together, the chickens can select the type and quantity of feed they require. This is reminiscent of people at the cafeteria line who select the desired quantity and food item. (Interestingly, chickens often make healthier choices than people do.)

Table 4, indicates what chickens will want to eat. It serves as a guide for what to feed daily, or every other day. Alternatives to grain are presented in the article.

The article can be found in

ECHOcommunity.org; [EDN 97](#). You might also be interested in reading our article on vermicompost, [EDN 104](#).

Energy 65%	Protein 32%	Vitamins, etc. 3%
Corn	Peanut meal ¹	Termites
Sorghum	Soybean meal ¹	Manure worms, (red)
Millet	Coconut meal	Earth worms
Broken rice	Sesame meal	Moringa leaves ²
Barley	Cotton seed meal	Leucaena leaves ²
Triticale	Amaranth florescence	Broccoli florescence
Wheat	Sour milk	Amaranth leaves ²
Amaranth grain	Garbanzo beans ¹	Dried fish meal
Buckwheat	Peas ¹	Vitamin premix
Cassava	Sesame seeds	Ground sea shells
Taro	Sunflower seeds	Ground, dried bones
Sweet potato	(all beans must be cooked) ²	(leaves, dried or fresh) ²
Other root crops		
Fresh coconuts		

¹For best results, all beans (legumes) must be cooked to neutralize trypsin growth inhibitors. For example, soybean meal is toasted before it is used in poultry feed. Layer chickens are less affected than broilers by trypsin inhibitors. If reliable information is not available, trial and error will inform you.

²Moringa, amaranth and leucaena leaves have excellent amino acid, vitamin and mineral content. They should be dried **in the shade** to preserve the vitamins and to reduce volume. They can also be fed fresh by hanging them in the pen (leafy end down) to keep them from being trampled. Either way, feeding leaves to the chickens will contribute greatly to the flock's health and productivity.

FROM ECHO'S SEED BANK

Ethiopian Kale (*Brassica carinata*)



This brassica originated in the East African plain, particularly Ethiopia, as early as 4000 B.C. where it is still grown primarily as an oil seed crop. It is valuable because it will set seed at warmer tropical temperatures than other brassicas.

Crushed seeds yield a high oil content, 25-45%. Care must be exercised as some varieties contain toxic substances.

Ethiopian kale is a nutritious vegetable, high in calcium and iron. Its leaves have less oxalic acid than spinach. Juice squeezed

from the leaves is a good source of vegetable protein

For more information on this interesting plant visit: <http://edn.link/ekale>



MEMBER HIGHLIGHT

Member Highlight

Javier Ignacio Silva Rivera, National Agrarian University (UNA), Agriculture Faculty (FAGRO, Nicaragua)

Javier currently coordinates the Training Center, a research demonstration center for the biointensive cultivation method, (CCID), at the National Agrarian University (UNA), Agriculture Faculty (FAGRO), in Nicaragua. The purpose of the center is to train in

and teach organic, self-sustaining, small-scale production using the biointensive method. Parallel to this is researching the productivity and adaptation of different crop varieties to tropical conditions with the logic of improving soil and productivity.

The CCID has been operational for 4 years during which 3 target groups have been trained: technicians of various NGOs, independent producers, professors, and students of various universities.

During these 4 years a large number of individuals have been trained in the method in much of the territory.

International Conference on Carbon Sequestration in Soil

The conference, "Sequestering Carbon in Soil" took place in Paris, France, from the 3rd to the 5th of May, 2017. The conference was attended by 200 individuals within which stood out a large number of scientists, subject matter experts, civil society, environmental activists, and philanthropists' producers from various parts of the world.

The main goal of the conference was to explore the scientific understanding of the current state of atmospheric carbon, soil carbon, emergent policies, and possible alternatives to mitigating climate change.

From my perspective, the most relevant issue was scientists' will to reorient the accelerated deterioration of global resources and global warming. This conference presented methods, techniques, conclusive data, and examples of tangible changes guided by the need for change. It was amazing to have the opportunity to witness masterful lectures, with real examples of change over time.

The work I perform was presented in a photo gallery which explained the efficiency of the method for the conversion of degraded soils to productive soils.

It became evident that there is still a great deal of debate on the priorities of the great nations and powers in relation to the reality of Latin American and Caribbean countries, since the needs of developing countries are food security and resilience to climate change.

One view which could be addressed was the importance of traditional production systems which have done the work of recycling organic matter in the soil and sequestered carbon over the years because of its low impact on agroecosystems, in total opposition to large-scale agriculture prevalent in other areas of the planet.

The next step to this conference is the creation of a large network of knowledge exchange where solutions, ideas, and publications will be presented to address the problems of atmospheric carbon and climate change.

Our Vision: Honoring God by Empowering the Undernourished with Sustainable Hunger Solutions

by Libby Arcia-Hird

ECHO is an international Christian organization that exists to reduce hunger and improve lives through agricultural training and resources. Working through regional impact centers around the world, ECHO equips with essential resources those working to eliminate hunger in connection with small-scale farmers. These resources include a vast knowledge base of practical information, experienced technical support, and an extensive seedbank focused on highly beneficial underutilized plants.

How we support your efforts

ECHOcommunity.org is your access point to many of our services. Through this site, our team of technical experts are available to answer questions and provide advice, while also learning from the experiences you share.

A number of ECHO produced publications (*ECHO Development Notes; Technical Notes; Agricultural Options for the Poor*) are available, free of charge, to all ECHOcommunity.org members. In addition to ECHO publications, we provide access

to a great number of other publications and credible information.

Training and Consulting

In partnership with a sponsoring entity(s), ECHO staff will travel to provide on-site evaluation of local conditions and make recommendations to address the issues impacting food security and the human dignity of the community(s) you serve.

ECHO staff will deliver trainings designed to meet the specific needs of your community(s) of small scale producers, community development workers, volunteers, or others working with your team. Training your trainers is a proven mechanism to impact sustainability and the efficient use of local resources.

ECHOES FROM OUR NETWORK

Questions from LA / C Notes 1

The first edition of ECHO Latin America / Caribbean Notes (LACN) was well received and elicited interesting questions which we will share with you. The questions have been answered by Dexter B. Dombro, author of the article "Making Silage in Vichada".

Q. How many cows can be fed from one bag of silage?

A. On the subject of the first question, Cebu cattle are slightly lighter than other breeds, such as the Holstein. If we estimate that a mature Cebu weighs 1,000 pounds (450

kg), the silage intake is 9 kg per day, while a Holstein (1,350 lb or 600 kg) can consume about 12 kg per day. A bag of 40 kg is then on average enough for 4 cows per day. However, at present cows are also grazing during the day, so in our case three packs of 40 kg each is enough for 30 cows, including calves, in the summer. It is not necessary to feed the cows in the winter.

Q. Do they have a cost / benefit number for a bag of silage?

A. The cost / benefit question in our region is about 67% better than alternative commercial products. For example, a 40

kg package of "palmaste" is worth \$60,000 Colombian Pesos in the store, plus the cost of transportation to the farm, while the cost of a 40 kg bulk of silage made on the farm is more or less \$20,000 Colombian Pesos, without a cost of transport given that production is located on the farm, then it's about 2/3 parts cheaper.

Q. So, \$27 CDN for the equivalent of \$9 CDN silage (not including transport costs). Would this be equivalent amounts of feed as well?

A. Undoubtedly there are variations in costs between countries, for us to grow elephant

grass and make our own silage is the most cost-efficient solution, plus a solution that works during the summer, when there are not so many alternatives.

Q. Does this translate into higher milk production (or meat)?

A. The idea is not to feed livestock exclusively, but rather to supplement the feeding of cows. In the eastern plains of Colombia the summer is rough, with a drought of 4 months, during which the grasses dry, the forages dry and it is not possible to establish alternative crops. While cattle are grazing all the time, it is absolutely necessary to supplement the nutrition of the

animals, to avoid a great loss of weight, or to get sick because of malnutrition. While there is no replacement for fresh nutritional fodder or grass in terms of animal nutrition, silage is a way to preserve most of the nutrients required for cows. Obviously, supplementing livestock feed is important for maintaining milk production, especially if the herd has calves.

BOOKS, WEB SITES AND OTHER RESOURCES

ECHO Forum @ECHOcommunity.org
Reviewed by Libby Arcia-Hird

We invite you to join our new Forum created for your networking and information needs. Learn from your peers, share your best practices, and ask your questions. This is for you!

Rediscover your love for ECHO resources **within your ECHOcommunity.org**. We have improved access by making it easier for you to find the information you need.

Alliance of Information Services
Reviewed by Libby Arcia-Hird

Alianza de Servicios de Información or Alliance of Information Services (SIDALC)

facilitates access to information produced in the Americas. This information is housed and organized in agricultural institutions, their libraries and other centers of related information. It makes available over 3.1 million resources, including books, magazines, thesis and reports, as well as over 240,000 complete text documents. This service is free and bilingual – Spanish / English. To access this valuable resource visit: <http://www.sidalc.net/es/inicio>

Nutrition in Central America and Panama (INCAP)

Are you curious about the nutrient content of the foods eaten in Central America? If you are, the Institute of Nutrition in Central

America and Panama (INCAP) produced a booklet with the composition of foods typical of the area.

To access this valuable information visit: <http://www.incap.org.gt/index.php/en>

CATIE

The Tropical Agricultural Research and Higher Education Center (CATIE) is a regional center dedicated to research and graduate education in agriculture, and the management, conservation, and sustainable use of natural resources. To learn more visit: <http://www.catie.ac.cr/>

UPCOMING EVENTS

ECHO Florida Events:
Location: ECHO Global Farm, USA
Presented by: ECHO

24th International Agriculture Conference

November 14-17, 2016

Introduction to Community Development

August 14 – 18, 2017

ECHO's remaining 2017 training schedule will be posted at ECHOcommunity.org/events.

ECHO West Africa Events:

Training in Ivory Coast

October 11-15, 2017
Location: Yamoussokro, Ivory Coast

ECHO Asia Events:
6th Biennial ECHO Asia Agriculture & Community Development Conference

October 3-6, 2017
Location: Thailand

ECHO's Regional Impact Centers regularly offer smaller-scale country or topic-specific training workshops throughout their respective regions. Please watch ECHOcommunity for further information. More information and registration details can be found on www.ECHOcommunity.org.

"Las Cañadas" Events

<http://www.bosquedeniebla.com.mx>

Biochar

September 4-8, 2017
Location: Mexico

Edible Forests

September 25-29, 2017
Location: Mexico

Agroecological Egg Production

October 2-5, 2017
Location: Mexico

Bioconstruction

October 9-12, 2017
Location: Mexico

ECHO East Africa Events

Strong Harvest Moringa Peer Educator Training Seminars

November 3-7, 2017
Location: Tanzania

New Hope Christian Church Events

Farming God's Way

August 24-26, 2017
Location: United States

This issue is copyrighted 2017. Individual issues of LACN may be downloaded from our website (www.ECHOcommunity.org) as pdf documents in English (1-2), and Spanish (1). ECHO is a non-profit, Christian organization that helps you help the poor to grow food.

PLEASE NOTE: At ECHO we are always striving to be more effective. Do you have ideas that could help others, or have you experimented with an idea you read about in LACN? What did or did not work for you? Please let us know the results!