

Poultry Centered Regenerative Agriculture

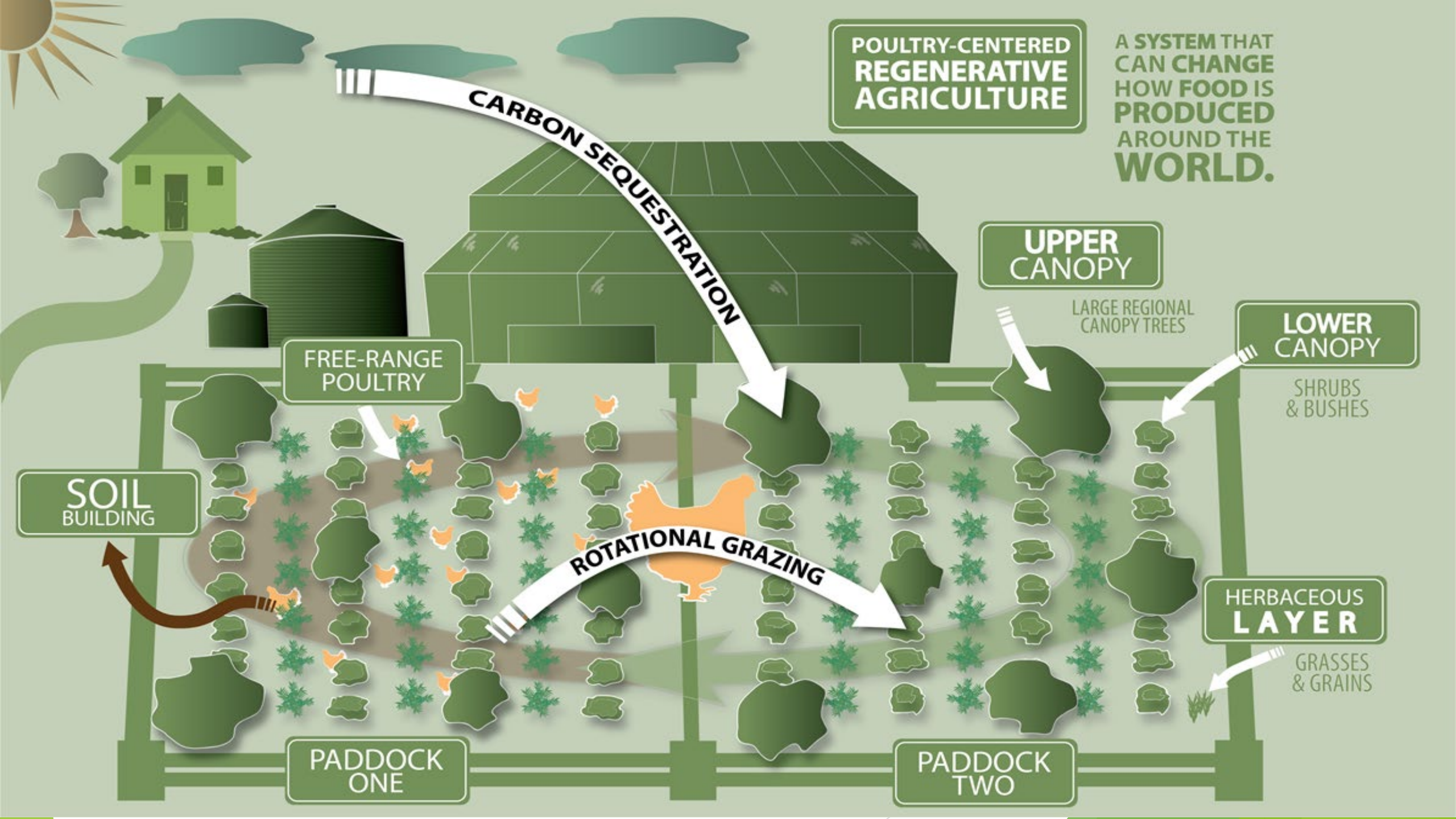
**Wilber De La Rosa
Bob Kell
Main Street Project
2020**



ADVANTAGES OF THE PCRA SYSTEM

- Multicultural animals
- Eggs
- Meat
- Manure for external areas
- Symbiosis with annual and perennial crops
- Restore the soil fertility
- Eliminate pests and diseases
- Excellent nutrients distributions
- Improve the soil aerations
- Relieve soil compaction







Coop Designs— Year Round Flex Coop

- ▶ Basic design for either meat birds or egg-layers
- ▶ 672 sq ft interior (14x48); 1440 sq ft solarium (20 x 72)
- ▶ Insulated shelter and solarium
- ▶ Extended season/year round
- ▶ Heat capture
- ▶ Allows for 3-5 flocks per year
- ▶ \$70,000



Flex Coop Design: Regeneration Farms

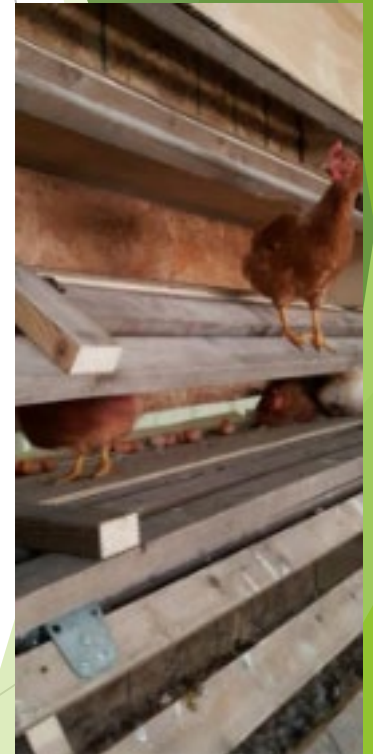
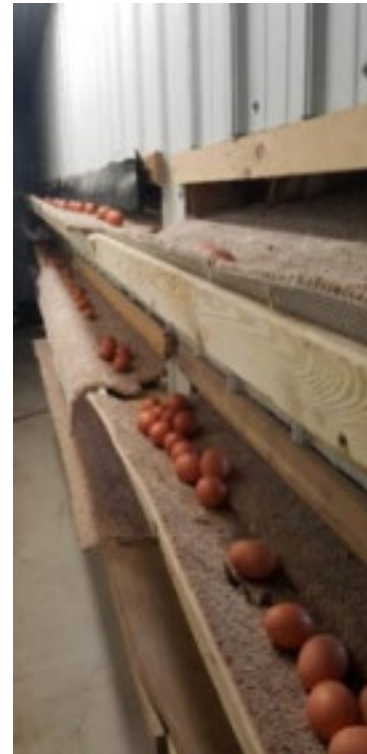


Flex Coop Design



Flex Coop with Egg Layers

- Construction of nest boxes
- Collection alley
- Requires additional space so that not restricting birds



Seasonal Meat Bird Coop Design-Canvas

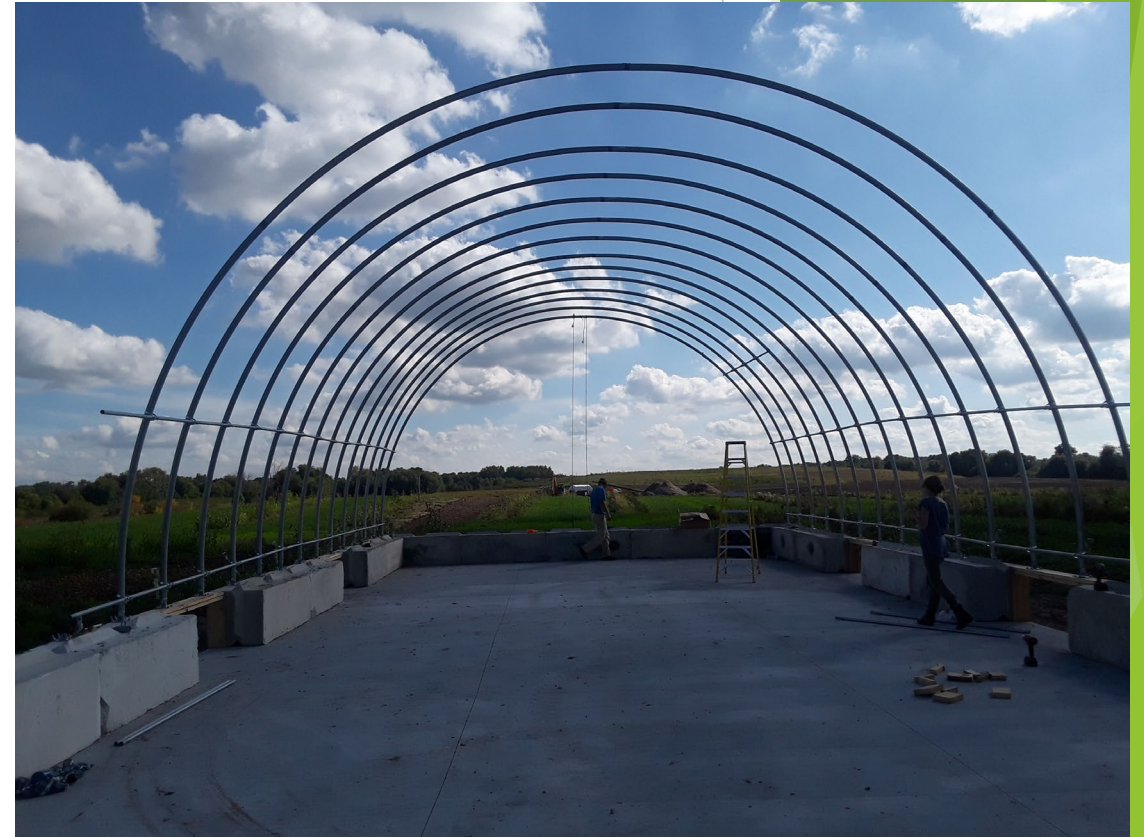
- ▶ 30 x 72
- ▶ Pad: Cement/Ecology blocks OR packed clay
- ▶ Pony wall for exit doors OR roll-up sides
- ▶ Benefits:
 - ▶ Ease of construction/less time lost/less labor costs
 - ▶ More affordable materials cost
 - ▶ 10-15 degrees warmer/cooler than metal siding w/o insulation



Seasonal Meat Bird Coop Design-Canvas



Seasonal Meat Bird Coop Design-Canvas



Seasonal Meat Bird Coop Design-Canvas



Post-Frame Building—Regeneration Farms



Seasonal Stick-Framed Building



Seasonal Coop-SEEDS Farm



Year Round Model- Bagley



Infrastructure

- ▶ Access Road: Feed delivery/loading birds
- ▶ Grain/Feed Storage: bin or wagon
- ▶ Water: tower/tank or water line
- ▶ Fence: 5' predator fence, Access gates



Introduction

Meat chickens are rapid growth animals that need constant care. There is not time to commit or correct mistakes given that it can quickly become costly when something goes wrong. For that reason, it is essential in avoiding errors that we create an environment where they can develop in the least stressing manner possible.

The first five weeks are extremely important for later success. These chickens will remain for 10-11 weeks. While the formative time for a human being is the first five years, for a chicken it is the first five weeks.

A chicken flock that starts well will bring results of a lower mortality rate and fewer birds that are underdeveloped. Avoid all possible stress during the first five weeks of growth. This is the moment in which the most important organs are developed, such as the heart, the lungs, the kidneys, the gizzard, etc. Stress slows down development and has a negative effect on the period of growth and on reaching the desired production objectives.



Regenerative Standards for Meat Birds		
Description	Requirements	Notes
Breed	Freedom Ranger chickens	This has been the breed that we have most researched and which we have found to be best adapted to the regenerative system.
Flock size	1,500	
Square feet in the brooder area	0.5 sq. Ft.	For the best adaptation of the chicks during their first 3 wks of life
Square feet per adult bird in the coop	1 sq. Ft.	This space is only used for sleeping after the first 3 weeks
PADDOCKS		
# of paddocks	2	The chickens should follow a system of rotation between the 2 paddocks
Area of exploration/ranging per bird in each paddock	20 sq. Ft.	
The paddocks should always have ground cover	Pasture growing and in continual development or dry s	Avoid bare ground to avoid erosion, contamination, or parasites
Time of rotation	8-12 days per paddock	It is going to depend on the regenerative capacity of the soil, the climate,the humidity of the soil, and the quality of the pasture or mix of seeds that are sown.
Living shade for the chickens in the paddocks	At least 50% of the total area	Provides shade, comfort and protection to the birds
Recommended perennials	Hazelnuts, elderberry, Aronia and nut trees	Recommended based on research
Recommended annuals	Corn and giant sunflower	Used while the perennials are developing and being established
PERCHES		
Linear perching space per bird	7 inches	Recommended but subject to change if the producer desires.
# of perches	For at least 50% of the birds	Recommended but subject to change if the producer desires..
Space between each row of perches	6 inches	Given the weight of the birds, they have limited capacity to climb.
Diameter of the perches	1-2 inches	With rounded corners and no sharp edges
Distance of first row of perches from the ground	12 inches maximum	At adult size, the chickens cannot jump very hight
Design of the perches	In form of a ladder/A frame	Recommended but subject to change if the producer desires
ACCESS DOORS TO AND FROM THE PADDOCK		
Minimum height for chicken access doors	18 inches	
Minimum width of access doors	18 inches	
Minimum length of access doors for each 1000 chickens	72 inches	two doors for each flock of 1500 chickens
# of access doors on each side of building for a complete flock	2	these walls and doors should be access to each side of the paddocks

DESCRIPTION

Perfect for free ranging, these are chickens with tri-color or red feathers which grow to 5-6 lbs in only 9-11 weeks.

Freedom Rangers are a great alternative to White, rapid growth meat birds or other heritage breeds of slow growth.. Freedom Ranger chickens grow at a moderate rythm, reaching their máximum weight of 5-6 lbs in 9-11 weeks. These birds are active with a very good aptitude for ranging and behave naturally in environments under our system of production, are robust, well adapted to breeding and pasturing environments and produce tender and succulent meat with more yellow omega 3 fat and less saturated fat tan rapid growth breeds.

They can have red or tricolored feathers with yellow feet, skin and beaks. They are an active breed and prosper when permitted to run freely, scratch and bathe in natural sunlight.



STANDARDS FOR FREEDOM RANGERS

Time in Brooding Area

3-4 weeks. The temperature should start at 95 degrees F and diminish 5 degrees F per week.

Types of Feed

21-22% protein Starter 2-3 weeks

18-19% protein Developer until week 7

16-17% protein Finisher from week 8 until processing.

After week 3 , the chickens are exposed to a mixture of grains fermented in water , apple cider vinegar and azomite to help with better development of the gizzard and better digestion. This mixture will be 10-15 % of the total diet given to the chickens as a supplement.

Index of Feed Conversion

2.5 lbs of feed for 1 lb of weight gain – harvested in weeks 8-9.

2.7 – 2.8 lbs of feed for 1 lb of weight gain – harvested in weeks 10-11.

Weight

Freedom Rangers take approximately 1-2 weeks more to reach the same weight as the white breeds (the common commercial breed)

Chickens harvested in weeks 9-11 come to have an average weight of 4.5-6 lbs processed weight

A live weight of 6 lbs produces a processed weight of 68-70%.

AGE	LIVE WEIGHT	FEED CONVERSION
14 days	.70 lbs	1.26-1.30
21 days	1.33 lbs	1.40-1.45
28 days	2.08 lbs	1.53-1.58
35 days	2.90 lbs	1.67-1.72
42 days	3.74 lbs	1.82-1.87
49 days	4.66 lbs	1.96-2.03
56 days	5.27 lbs	2.10-2.16
63 days	5.95 lbs	2.31-2.34



This is a checklist of the materials that must be ready before the chicks reach the chicken coop.

disinfected chicken coop (walls, ceiling, floor, windows, doors, etc.)

disinfected materials and equipment (feeders, drinking fountains, hangers, containers, tools, tractors, pipes, etc.)

heat lamps

wood bed shavings

chick feeders

chick drinkers

brooding rings

infrared thermometer

chick feed (18% protein for weight gain and muscle development)

fresh and clean water

supplement of electrolytes and vitamins for chicks / sugar for energy

infant ear thermometer (to check the chick's body temperature from its cloaca)

sheet to collect daily data



Make sure the chicken coop is clean, tidy and warm before the chicks arrive. Not only the air must be at the right temperature, but in particular the floor, the feeding system and the drinking water and the wood chips that serve as a bed. Cold water ($<60^{\circ}\text{F}$) produces a low body temperature, which day-old chicks cannot adjust to and could cause stress from the cold. Make sure the chick level air temperature is between 91 and 94°F using the heat lamps.

Verify that everything in the chicken coop works correctly: heating lamps, thermostats, fans, that the food is fresh, that the water system has adequate pressure on the nipples, see that there are no residues or disinfectants in the water, and finally the lighting.

Therefore, make sure that the temperature in the brooding ring is correct and that the chicks are kept warm. Just remember that chicks who are cold do not eat or drink enough.

When the chicks arrive, they will be tired and want to rest. Remove the chicks from the boxes as quickly as possible. Place boxes that cannot be handled immediately in a separate room at a temperature of $71-73^{\circ}\text{F}$, not in the chicken coop if it is much hotter (above 86°F)





Evaluation of the
new flock

CHECK	RIGHT	WRONG
Ideal temperature	between 103 -105 ° F	above 106 is very hot, below 102 very cold. Should be 104 the first 4 hrs.
Uniformity	all the chicks should be the same size	that 15-20 % of the chicks be 15-20% larger or smaller.
Underside	that it is clean, dry, and shiny	that it is dirty, humid, and sticky
Stomach	the stomach should be soft and flexible	the stomach is hard and the skin tense
Beak	the beak should be clean with the nostrils closed	beak is red, wet and dirty nostrils, some malformation
Feet	should have a normal yellow color and not be inflamed	feed are red and inflamed, malformation , crooked toes and feet too cold
Navel	must be clean and hard	hard, remains of yolk, open navel, albumin stained feathers
Eyes	clean, open, and bright	eyes closed and dull/tired
Reflexes	put them on their backs, it will take them 3 seconds to stand up	it takes more than 5 seconds for them to stand up, no interest in anything, sad
Floor temperature	86 ° F	

Signs of comfort in day-old chicks

After being released, the chicks have to get used to their new surroundings and rest a little before going to explore. Therefore, it is normal for them to remain still for a while, but after about four hours they should begin to spread, explore and feed. If they don't, the bed or the air in the chicken coop could be too cold. The cold will lead to a bad start.

If they are sitting very close together on the first day, for example, because the temperature is too low, they will continue to do so if you do not react. This sows seeds for underdeveloped birds and therefore for a un-uniform flock. Sitting together can also cause them to get too hot. Try to spread the chicks as soon as possible after arrival by increasing the temperature and slightly dimming the light.

If all the chicks are pressed against the wall, the light is too bright or too warm in the middle of the ring. If the chicks are too cold, they will peep loudly.



Importance of brooding rings

A brooding ring is used to keep the chicks warm during this very important moment (1-3 weeks). A simple brooder consists of an infrared heat lamp with a bell on it to direct heat to the floor and a brooding ring is a protective circle of cardboard, solid plastic or wire mesh to keep chicks confined in an area near the heat source.

250-500 chicks for each heat lamp, place the barriers in a circle of approximately 10-20 feet in diameter. Enlarge this brood ring regularly after one week and remove it after three weeks, so that the chicks have enough space. During this initial period of the chicks, corners are avoided to prevent them from accumulating and becoming suffocated.



Heat lamps

Make sure the floor is nice and warm and that the bed material is an inch and a half thick. Hang the heat source at approximately knee height so that all chicks can sit in the heat radiated by the heat source. As the chicks grow, they increase their space, so the heat should gradually move up.

This increases the area of the floor that is heated by the heat source and at the same time allows all the chicks to adjust to the heat at their own optimum temperature. An additional benefit of placing the heat source higher is that the temperature under the lamp decreases gradually and can slowly change to space heating without drastically affecting the temperature of the chicks.



Chick distribution within a brooding ring.



This situation is: optimal, the chicks are scattered throughout the space. They have total comfort, the temperature and humidity parameters are in perfect levels.



This situation is too hot. The chicks may be too sleepy, they will be scattered around the perimeter of the brood ring away from the heat source. Hang the heater higher.



This situation is very cold for the chicks they will be piled up wanting to be near the heat source and they will make a lot of noise. Check and take the necessary actions to regulate the temperature.



This situation is because there is a lot of noise. The chicks may also be running away from a bright light or an air current. If the chicks are piled on each other, it is because there is an air current that will cause the temperature in the group to be very high due to the lack of ventilation. This will cause the chicks to overheat, which is very stressful for them.



Chick behavior the first day.

Behavior is a good indicator; Check the chicks every two hours if possible, not only during the day but also at night.

The chicks must disperse throughout the space: that means the temperature and ventilation are fine.

If the chicks are huddled together in some places, they are less active, have no desire to move and appear dazed: the temperature is too low.

If it seems that the chicks are avoiding certain places it is because it could have currents of cold or very hot air observe and correct.

If the chicks are on the ground with their wings extended, they start to gasp for air and start chirping it is because there is too much heat or there is too much carbon dioxide in the air, just measure it to know and prevent it..



CARE OF THE CHICKENS WEEK 1-4

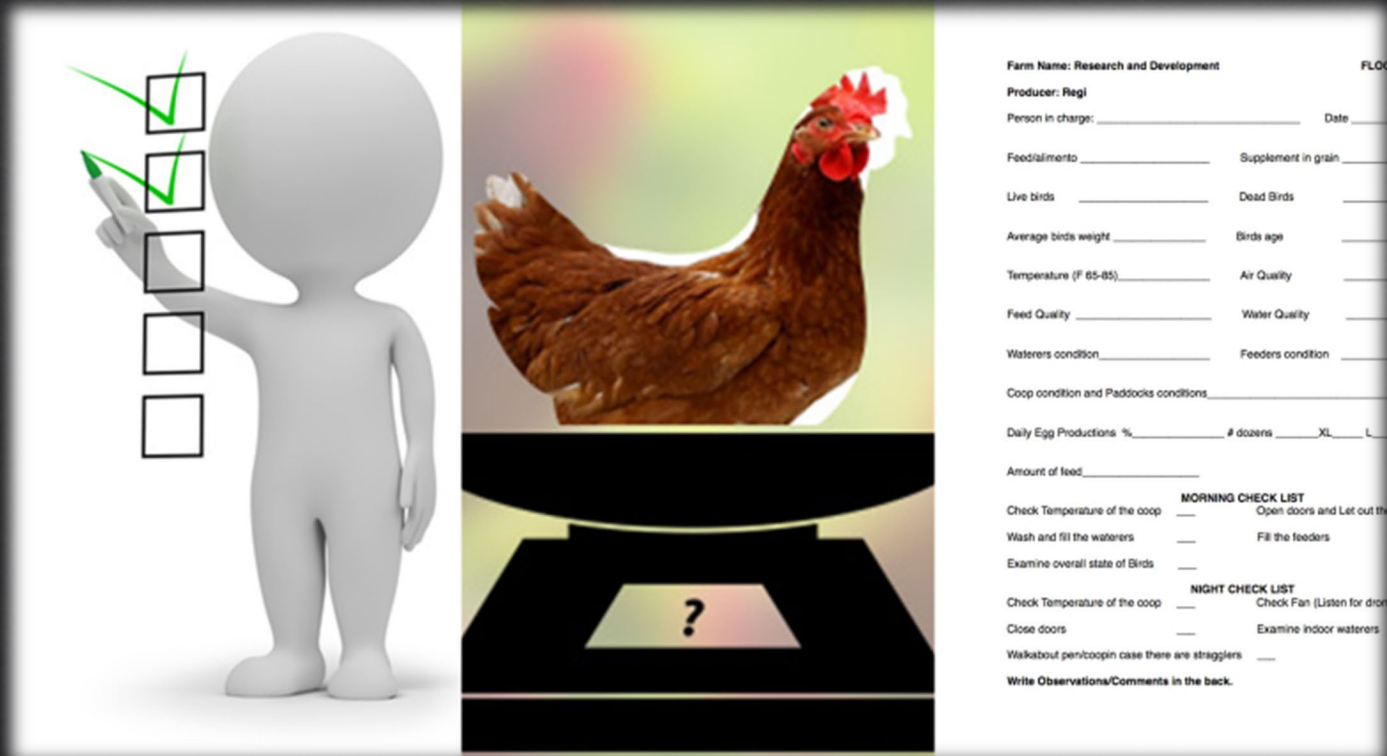
Provide the ration and appropriate food according to the age of the chicks.
Provide fresh and good quality water 24/7.
Provide comfort with the appropriate temperature indices.
Take 15 minutes in the morning and in the afternoon every day to observe their behavior.
Provide apple cider vinegar from week 3 at a dose of 1% of the total water consumed.
Prevent water leaks that can make the chicks' bedding wet.
Constantly observe the air quality inside the chicken coop.
Observe inside and outside the chicken coop for the possible approach of predatory animals.
Provide the chicks with a mixture of fermented grains as a supplement after week 3.
Be aware of the inventory of materials and tools, so that they are available when needed.
Avoid at all costs the death of chicks by stacking.
Constantly check that the bed of the chicks is not wet, totally dirty with manure or cold.
Play classical music if necessary to create a quieter environment inside the chicken coop.





Importance of taking daily records.

It is important to take daily data on the condition of the flock from the beginning. This is in order to keep records of everything that happens in the day, such as food consumption, chick weight, health status, the status of all equipment and materials, dead birds, the number of birds, some problems and the solution of this as note, inventories etc., etc. At the time of an audit, the data we have collected supports us and allows us to make better decisions in future situations taking into account past data.



BIOSECURITY ON THE FARM (MAIN STREET PROJECT)



INTRODUCTION

Meat chickens are animals of rapid growth who need constant care. There is no time to correct errors; and mistakes mean high costs. For that reason, preventing mistakes is crucial. Adequate management begins with the recognition of the signs of alarm in practice. For producers of meat birds, this means being alert when you are in the the coop and the paddocks, observing and listening to the animals, paying attention to their environment and to their behavior as individuals and as a group. This generally provides important information about the health, wellbeing and production of the animals.



Why is Biosecurity important in our production units?

The birds can be affected by illnesses (viral and bacterial) and by parasites (internal and external). For that reason, it is necessary to establish a prevention and control plan to avoid attacks that can cause damage, including the death of the entire flock.

Biosecurity and hygiene are necessary to prevent the outbreak of illnesses. Biosecurity implies isolating the sick birds, restricting human access to the paddocks and the coops, maintaining the paddocks free of any materials that can cause a risk of damage to the birds, and adequately eliminating the dead birds, all so as to avoid the introduction of diseases in our production farms.



Steps for a basic Biosecurity Plan on the Farm

DISINFECTING THE COOP

OBJECTIVE:

The main objective for disinfecting the coop is to eliminate all the pathogens that can cause illnesses in our birds (parasites, bacteria, fungi and viruses) from all surfaces within the coop (floor,, ceiling, walls, perches, doors , windows, etc) and from all materials and equipment that are used in the management of the new flock (feeders, drinkers, waterlines, tools, plastic buckets, etc.). With this practice, we ensure that the new chicks arrive in an innocuos environment that supports their healthy development during their first three weeks of growth, since it is in this period that their defense system against illnesses becomes strengthened.

A good practice of disinfecting the coop at the beginning of production can guarantee a low number of deaths of chicks during the first three weeks of life.



METHODOLOGY

Step #1

The first step for efficient disinfection is to remove all equipment to the outside (feeders, waterers, perches, etc.), and all organic matter from the coop and solarium (manure, bedding, etc.)



Step #2

Next, all dirt should be removed from the ceiling, walls, windows, and the floor with a powerwasher. Following that, all surfaces should be wet down with a mixture of water and antibacterial soap, and then brushed with a broom or brush to eliminate any contaminating manure from the surfaces of the coop.



Step #3

After 20 minutes, all surfaces should be rinsed with just water to remove the soap. Then, one should use a backpack sprayer to apply a bleach mixture to the ceiling, walls, windows, doors and floor. The proportion of the mixture should be a maximum of $\frac{3}{4}$ of a cup of bleach per gallon of water. Leave this mixture of water and bleach on the surfaces for half an hour, then rinse lightly with water to remove the bleach and let them dry naturally.



Step #4

When you finish washing and disinfecting the surfaces within the coop, proceed to do the same with the equipment outside (feeders, waterers, perches, plastic containers, and tools.)

This activity should be done four to six days before the arrival of the new chicks to the coop.



Clean and disinfect vehicles and equipment.

When vehicles or equipment come from a production areas where one suspects that some type of outbreak of disease exists is when the process of cleaning must be more rigorous and strict. Clean and disinfect the vehicles which enter the farm, equipment such as tractors and manure spreaders, and the tires of trucks and vehicles that frequently deliver materials.

The disinfecting should be done with a manual or motorized backpack which has good pressure. The dosage of bleach to use is 1 ½ cups of bleach for each gallon of water. With this mixture, spray the surfaces of the tires of the vehicles and equipment that enter the farm.



Avoid the entrance of unnecessary visits and equipment

It is necessary to rigorously control the access of people to the farm, prohibiting access to the production areas of the farm to any person not involved in the production activity. Only those people who have a direct link to production (fixed workers, farm supervisors, veterinarians and scheduled visits) can access the interior of the farm's production areas, previously taking all necessary biosecurity measures. Keep in mind that anyone who enters your farm can bring disease-producing agents on their clothing and / or footwear, which can cause an outbreak of disease in birds. With regard to disinfection of footwear, it is useful to use plastic bags on top of private footwear, rubber boots or footbaths at the entrance of farms that contain a disinfectant solution (the same mentioned above: 1 1 / 2 cups of chlorine per gallon of water). Also, you should have hand sanitizer gel available for constant visits.



Avoid contact with wild game and migratory birds

Do not raise, care for, or have contact with pet birds, ducks, geese, wild turkeys or other game birds. All of them can be potential carriers of diseases transmitted by virus, parasites, fungi, or bacteria. If possible, restrict yourself from visiting where there are ducks or water fowl. If you have frequent visits from this type of bird, create a human strategy to not permit them to get close to production flocks.



Sick and Dead Birds.

Due to the cannibalistic tendencies often seen in birds, you should house flocks that only include birds of the same age and size.

It is possible because of the management of the birds that one or several of the birds become injured either by the flock itself, by accidents or by predator attacks, etc. You should have a first aid kit and a special area where you can isolate these birds under constant observation and treatment until their total recuperation or death. The dead birds should be composted at a site far from the coop and paddocks, covered by more than 6 inches of dirt or compost, or should be doubled bagged in plastic for quick collection and transport to a special disposal site.



Cleaning and Organizing of Tools

It is essential to keep everything clean. For example, the workers should use appropriate clothing reserved for exclusive use on the farm (boots and overalls). Before any contact with the birds, disinfect your hands and arms. Keep the tools in one place and organized. The paddocks should be clear of any plastic, glass, short sharp articles or any other objects that can cause physical harm to the birds. Avoid letting the bedding become humid or wet, to prevent that the level of ammonia get higher than 20 parts per million inside the coop. Also, you should disinfect all the surfaces inside the coop once a month with a mixture of water and vinegar (one gallon of vinegar for each gallon of water). To do this, move all birds to the paddock and do it in the morning or evening when it is coolest. You should also maintain rigorous control of pests (rats and mice), using AgriD, glue traps, pressure traps, etc. These animals can carry disease and cause injury to the chickens.



Recognize the most important warning signs of poultry diseases.

These are some signs that you should be able to identify to avoid high or complete mortality of your flock. Among these are: a high death rate of chickens, a reduction in the consumption of feed, swelling of the head, eyelids, crest and feet, diarrhea with blood, bluish-purple discoloration of the chin or crest, bloody discharge from the nose, sad birds, inactivity or the loss of capacity to move, and the lack of coordination. If any of these symptoms occur in your flock and you do not know what to do, consult for technical assistance immediately.

Types of illnesses that can develop in our meat production units:

- Behavioral Illnesses
- Metabolic/Nutritional Illnesses
- Infectious Diseases
- Parasitic Diseases



Chickenpox or Smallpox

Symptoms: Chickenpox can occur in two forms: wet or dry. In the dry form, the featherless areas of your bird will have wart-like lesions that will heal in about two weeks. The wet form of the disease presents lesions that appear around the mouth and discharge from the eyes of your bird.



Infectious bronchitis

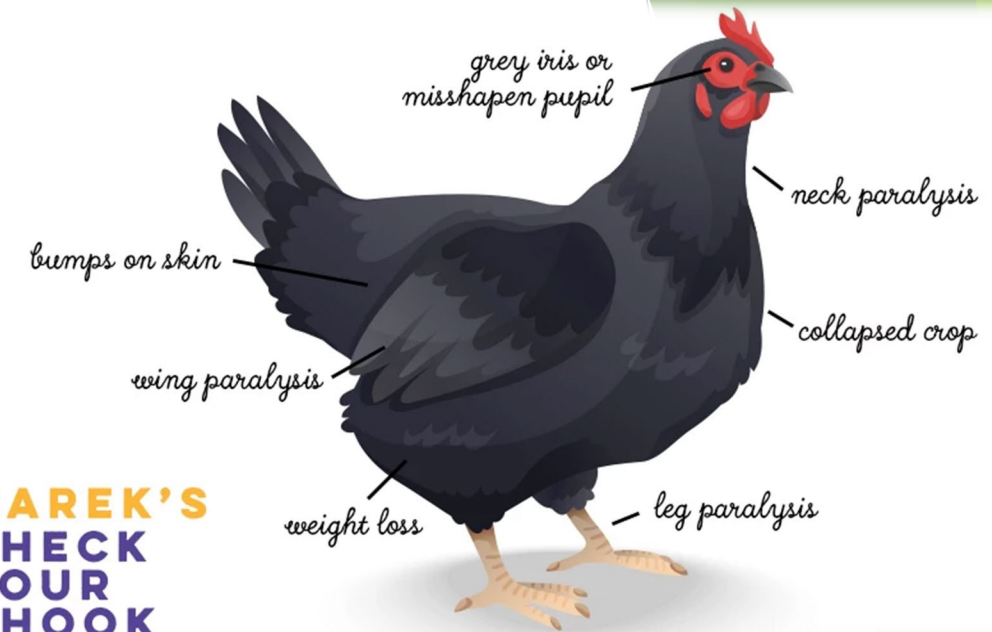
Symptoms: Like humans, their chickens can catch a cold, and it is just as contagious. If your flock becomes infected, you will notice that the production of eggs will decrease, the consumption of food and water will decrease, there may be a discharge from the eyes and nostrils of the birds, and you may notice difficult breathing in your birds.



Marek's disease

Symptoms: This disease, also known as paralysis of birds, usually affects chickens between 6 and 11 weeks of age. If your chick has developed tumors, has irregularly shaped pupils (usually causes blindness) or develops partial paralysis, you probably have Marek's disease

**MAREK'S
CHECK
YOUR
CHOOK**



Newcastle disease

Symptoms: As a respiratory disease, Newcastle symptoms (ND) tend to appear through respiratory difficulties, runny nose, cloudy eyes and a reduction in egg laying. Sometimes birds can experience twisting in the neck and paralysis in the legs and wings. There are several strains of this poultry disease, some of which are more lethal than others.



Infectious coryza

It is a disease of the upper respiratory tract of chickens, characterized by producing nasal discharge, sneezing and facial inflammation. The etiologic agent of this disease is the bacterium *Haemophilus paragallinarum*. The economic impact of this disease lies in the losses caused to poultry farming, due to growth retardation, weight loss, increase in the number of birds eliminated and predisposition to complicated chronic respiratory disease.



Coccidiosis

According to a study by the Veterinary Faculty of the University of Zaragoza in Spain, avian coccidiosis is a parasitic disease caused by protozoa of the Phylum Apicomplexa, and affects various species of birds, especially chickens and hens. Its main symptoms are:

1. Diarrhea
2. Bristling feathers
3. Anemia
4. Size reduction
5. Alteration in plumage color
6. Drowsiness.

In addition, due to the lack of nutrients, the quality of meat and eggs decreases.





FOCUS ON PREVENTION

Weekly weight control (10% of flock)

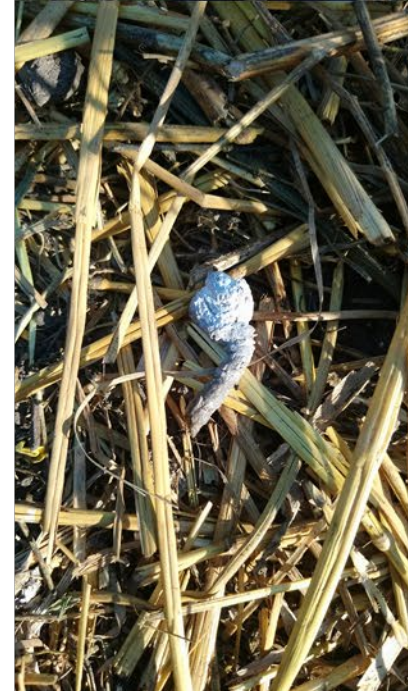
Physical check-up once a week (10% of flock)

10-15% extra grain mix of the total diet (as a supplement) twice a week

corn (x), wheat, sorghum, oats, buckwheat, sunflower seeds, and forage pea

For 100 pounds of grain, we use 40 liters of water, three cups of apple cider vinegar, one pound of azomite and two ounces of salt. This mixture of water and grains is oxygenated twice a day to avoid fermentation of the grains. The grains absorb 90% of the water in 3 days. On the third day, the mix of seed begin to germinate.





Swelling or scabs on the footpads of the feet means wet or sharp objects

Stiff or hot joints will be inflamed

ESTABLISHMENT AND MANAGEMENT OF PADDOCKS



INTRODUCTION

Part of the success of operations for the regenerative production of meat birds is the good management (consistent, appropriate and efficient) of the paddocks where the birds spend the majority of their active time. It is there they can act naturally, scratching, eating insects, giving themselves dirt baths, feeding on fresh greens, eating, resting, and protecting themselves from flying predators.

In the first place, the paddocks should have the capacity to support the number of chickens (bird density) that has been designed from the beginning, so that overgrazing can be avoided.

The standard is 21 sq. ft. per bird for each paddock or a total of 42 sq. ft.



ESTABLISHMENT OF PERENNIAL PASTURE

Once you have chosen the correct pasture seed (a mix of seed that will support being walked on by the birds being produced there), proceed to sow at a density 50% higher than that recommended by the seed provider for perennial pasture. This will create a high quantity of biomass from the beginning. A suggested seed mix is the following:

- 20% Perennial Ryegrass
- 15% Hdr Meadow fescue
- 15% Ginger grazing
- 15% smooth Bromegrass
- 15% Spring green festulolium
- 10% Barolex tal fescue
- 5% Chicory
- 2,5% Birdfoot trefoil
- 2.5% Alice White grazing clover



ESTABLISHMENT OF PERENNIAL PLANTS

When the pasture is 50% developed, proceed with the planting of perennials (hazelnuts, shade trees, fruit trees, etc.). It is recommended to plant seedlings that are at least 2-3 ft high or taller.



IMPORTANCE OF ANNUAL CROPS AND PREGERMINATED SEEDS





	PADDOCK BASE		NON-PADDOCK NON-ENRICHED	
ANALYTE	AS RECEIVED	DRY BASIS	AS RECEIVED	DRY BASIS
MOISTURE (%)	64.95		58.12	
DRY MATTER (%)	35.05		41.88	
ASH (%)	13.38	38.17	1.06	2.53
FAT, ETHYL ETHER (%)	0.55	1.57	1.38	3.3
FIBER, CRUDE ANKOM (%)	2.39	6.82	2.89	6.9
PROTEIN N X 6.25 (%)	3.47	9.9	5.76	13.75
PHOSPHORUS (%)	0.1418	0.4046	0.1959	0.4678
COPPER (ppm)	4.23	12.07	2.12	5.06
CALCIUM (%)	0.11	0.31	0.02	0.06
IRON (ppm)	2658	7583	51.33	122.6
MAGNESIUM (%)	0.1	0.29	0.07	0.16
MANGANESE (ppm)	123	350.9	10.03	23.95
POTASSIUM (%)	0.25	0.72	0.22	0.53
SODIUM (ppm)	34.65	98.86	9.32	22.25
SULFUR (ppm)	483.6	1380	677.3	1617
ZINC (ppm)	30.05	85.73	17.58	41.98
	STARTING WEIGHT	FINAL WEIGHT	STARTING WEIGHT	FINAL WEIGHT
PAUNDS	2	8	2	3.06

Marketing Hazelnuts and Elderberries

- ▶ **Beyond chicken or eggs, additional revenue from perennials**
 - ▶ in paddock and on farm
- ▶ **HAZELNUTS**
 - ▶ Nuts
 - ▶ Oil
 - ▶ Flour
 - ▶ Meal (feed)
 - ▶ Biomass
- ▶ **Midwesthazelnuts.org**
- ▶ **Processing for Industry**



Marketing Elderberries and Elderflowers

ELDERBERRIES (flowers, berries—teas, herbal medicine, beer, syrup)

- ▶ **\$25/lb for elderflower**
- ▶ **\$3000/acre**
- ▶ **Develops quickly (Yield in 2nd year)**
- ▶ **Developing market**



Managing Finances—Flock Example



Cost of Production

Chicks	1.23	1500	1845
Starter	0.30	4500lb	1350
Bedding	5.25	40 bags	210
Grower	0.22	14000#	3080
Straw	5.00	30 bales	150
Grains	11.50	40 bu.	460
Vinegar	7.70	10 gal	77
Vitamins	3.50	2 packets	7

Managing Finances—Flock Example

Electricity			150
Flock Labor	12.00	160	1920
Transport			680
Processing	2.90	1450 birds	4206
Storage and Distribution			1800
Coop Payment			2200
Total Costs			18135
Revenue	1450 x 4.2lbs x 3.39/lb		20645

Retained by producer 2510 (profit) + labor(1920) = 4430

Marketing: Diversified Clients

Direct Sales (CSA, Dropsites)

- ▶ Pre-ordered, higher price, focused sales
- ▶ Farmers Markets: time and logistics

Institutional

- ▶ Volume, price break
- ▶ Can be seasonal (academic year)

Retail

- ▶ Mark up 30%
- ▶ Volume may vary
- ▶ Packaging more important
- ▶ Pieced vs whole

Restaurant

- ▶ Portion size, menu



Distribution Models

- ▶ Working with an aggregator
 - ▶ Regeneration Farms - production contracts
 - ▶ Food Hub
- ▶ Independent
- ▶ Cooperative



**REGENERATION
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