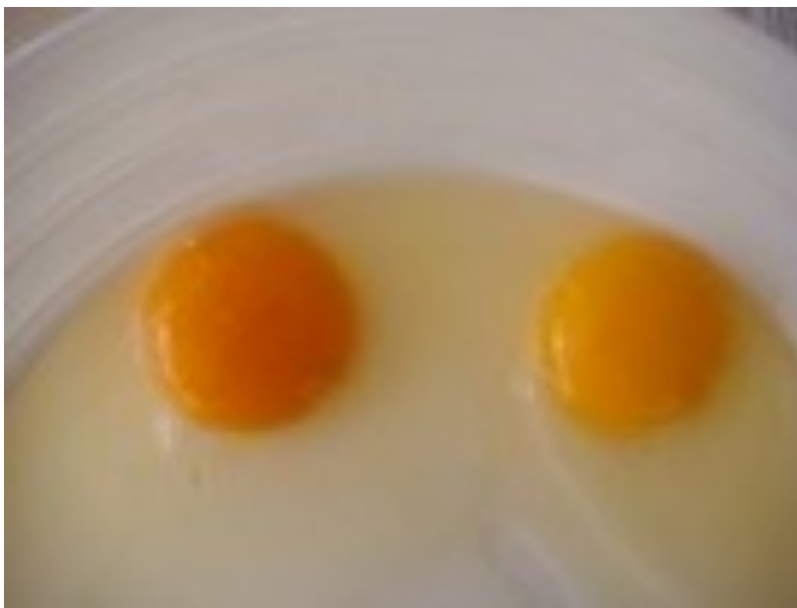


Some farmers (and spouses) can add to their income by farming poultry.

People are becoming more health conscious and are seeking free-range eggs and free-range poultry meat, to benefit from the more natural and better feeding and health conditions under which they are farmed. Feelings for animals and birds also encourage people to buy free-range products.

An additional advantage of free-range poultry is that they consume a lot of flies and other insects that trouble us.

Which egg would you prefer? The one on the left is free-range on ryegrass and clover pasture, and some grain with minerals for health and for their crop to soak. NZ free-range eggs are selling in USA at 12 times more than the local Californian eggs.



Free Range Eggs NZ (FRENZ)

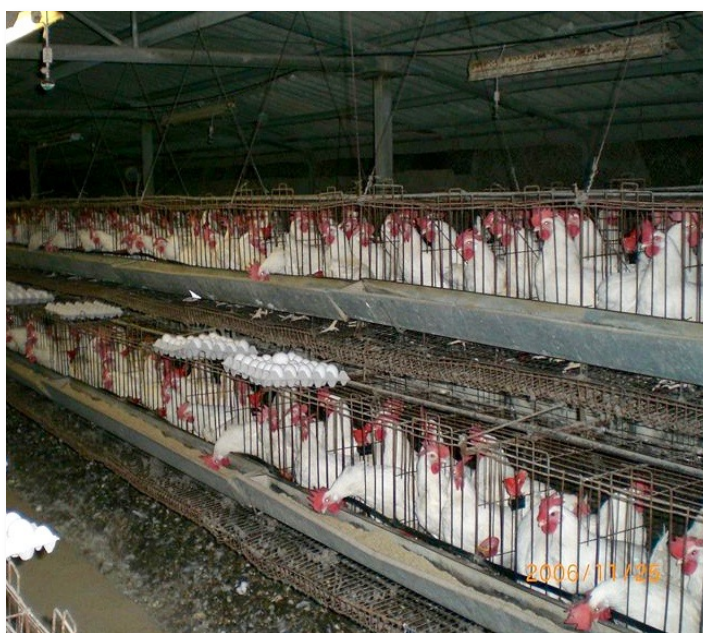
- FRENZ suppliers must have no more than 860 hens per hectare.
- FRENZ eggs contain up to 70% more vitamin B12 than standard eggs (shown by independent tests).
- Approximately 25% of NZ FRENZ eggs are exported to California, Texas and Hong Kong.
- FRENZ has air-freighted more than 20 million eggs to California since 1991.
- NZ must export foods to wealthy countries to succeed long term.

One of New Zealand's most respected organic egg pioneers says the future of local industry growth lies in expanding the lucrative USA and Chinese markets. Founder of The Free Range Egg New Zealand (FRENZ), Graeme Carrie, says that organics, free range, sustainability and natural foods are being sought and are areas that are important for the future of NZ sales.

Carrie has exported more than 20 million eggs under the FRENZ banner over the last quarter century and says FRENZ is the largest organic and free range egg supplier in New Zealand and still the only New Zealand business exporting eggs to the US.

Carrie of Free Range Egg & Poultry Company (Frenz) earned NZ\$1 million (US\$700,000) in 2006 by sending a quarter of a tonne of eggs a day and selling them at US\$12/dozen, while local battery eggs shown her sold for only US\$1/dozen. There are USA free-range eggs that sell at only US\$6/dozen because some are not salmonella free.

Acquiring birds from Salmonella-free parent flocks is an important means to reduce infection. Competitive exclusion is used effectively in some countries to reduce the likelihood of establishment of salmonella (bacteria and food poisoning) in the gut of very young chicks. Laying hens should be raised under conditions that minimise stress. It has been reported (Nascimento and Solomon 1991) that stress can cause oviduct damage, leading to ultrastructural defects in the eggshell, increasing the susceptibility to bacterial invasion, which can spread in these



conditions. Look at the manure at the bottom.

Feed

Contaminated feed is often a significant source of salmonella, attributed to animal derived ingredients such as animal by-products, and fish meals. All fish products are usually old by the time they are fed, or eaten by humans, so should have been kept in fridges until fed, like human fed fish and meats are, but supplements in the form of pellets are not (ours are from date of purchase). Provision of Salmonella-free feed is regarded as an essential factor. For broiler feed, this is often done by processing feed into pellets, with the associated heating which is effective if done correctly, in eliminating Salmonella, provided recontamination is prevented. Layer feed is mostly (unpelleted) mash, which does not receive adequate heat treatment to kill pathogens (something that can cause a disease). The addition of organic acids is often used to reduce contamination in mash, which has the advantage of protecting feed against recontamination during storage and distribution. Where feed can become wet (free range), it should be fed in suitable dry containers and bins.

Pasture-raised hens produce eggs with four to six times more vitamin D, more omega-3 fatty acids, more vitamins A and E, and less cholesterol and saturated fat, than factory-raised hens.

If you are interested in becoming big in free range eggs, then Google www.frenzs.co.nz (Free Range Eggs NZ) and www.foodsafety.govt.nz

Managing free-range

Small numbers of hens can be kept in pens that are on wheels, so they can be moved to fresh pasture each day. Large numbers can be housed in a building in the centre of a paddock with the wagon-wheel system of subdivision, using electric fencing. A dozen or more V shaped paddocks from the pens can be constructed. Better still, small low pens that can be towed to new sites to allow larger areas to be grazed. Poultry will normally not go more than about 100 metres from their house unless encouraged with feed and water.

These three separate buildings can be towed by the chains shown. The hens shown are going back to lay.

Coarse sand or small gravel, as shown, should be spread around the entrances to avoid dust and mud.

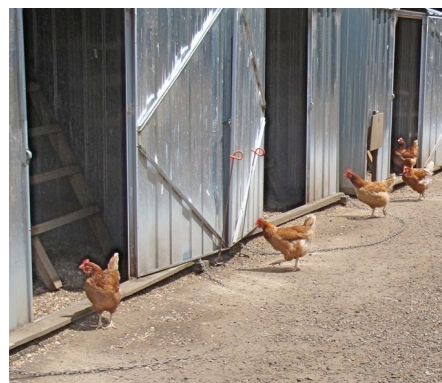
Poultry need to sleep under cover so require a house, but during the day in fine weather they are much better off out on pasture. In wet weather, orchards are good, or they need enough covered space to keep dry. This can be achieved by having the houses large enough to do this. Alternatively, a low-cost plastic cover can be erected above the exit/entrances to give covered outside areas. Plenty of raised perches can help, but don't place them over their food or water. Water should be available on the pasture.

Poultry are happy to sleep close to others at night, but during the day they prefer space.

Shelter

Shelter belts of trees or hedges are advisable because, like us, poultry dislike wind. In cold weather, shelter belts can keep the temperature quite a bit higher, and reduce wind-chill substantially.

Position the house on a raised area near the centre of the area to be grazed. The area where the poultry come and go from the house can become muddy in wet weather and dusty in dry weather, so have an apron of concrete, wood, chips or sand, so that hens spread out rather than create one path. It should slope away from the house. The wood or chips must not come from timber that has recently been treated with Copper, Chrome and Arsenic (CCA) against insects and rot, because the treatment could adversely affect the poultry and would not be in keeping with organic rules. One of the V shaped paddocks should be for training them to electrified wires. It can have three wires spaced at half the height of the poultry from the ground, and the same distance between wires. The other fences can have just two wires 15 cm (6 inches) apart, which should contain them. If they don't it doesn't matter, because at night they will go to the house, where hanging one-way traps should be used, to allow them to push in and not out into that V paddock. They can be latched up to allow access to



the paddock to be grazed. These traps should be blocked off at night to keep predators out.

Free-range in orchards works well. Chickens are very easy to control. They come to people when called. These came up to me within seconds. The eggs from these 2,200 hens fetch a premium while they keep the grass down to reduce mowing, control insects to save spraying, eat dropped fruit, turn it all into manure, and have shade in summer and protection from cold in winter. Vineyards and other fruit orchards can increase income and lower their costs this way.

I was quicker photographing these before they came to me.

Because the 2,200 hens are free to roam the orchard, no fencing is necessary. They lay and roost in their buildings shown above.



Fences

Where necessary, white or white and a coloured poliwire held on fibreglass posts with spring clips or 60 cm (24 inch) seven-lug mini-treadins are the best. They are cheap, easy to erect, and easy to roll up if part of the area has to be made into hay to control surpluses, or cropped to use the fertility that will build up.

Calves or sheep can also be used to graze surpluses. Grazing or harvesting surpluses is important, because poultry like short grass shoots, not long grass. Also they will make nests and lay eggs in long grass, instead of in the buildings.

The back boundary of the wagon wheel area should have a dog-proof fence of five or more 2.5 mm high tensile smooth wires spaced at 10 cm (4 inches) from the ground, and then be 15 cm (6 inches) apart. The ground under the fence should first be made smooth so that the four inches to the bottom wire is maintained. At least 3,000 volts should be on the fence in all conditions. If dogs are a problem, an offset high tensile wire on offset brackets should face outwards at about a foot from the ground.

This height is to encourage dogs to crawl under the wire and so get a shock, rather than jump over it or through the fence without getting a shock, learning a habit which is hard to stop. In very dry areas a live/earth (USA ground) system may be necessary. This involves having the bottom wire live and the next one earthed (USA grounded) back to the energiser earth (USA ground). The offset should be live.

The pasture sown can be about 15 kg/ha of perennial ryegrass, one kg/ha of Tahora small leaf white clover and one of lucerne. The lucerne may gradually thin out, especially if calcium is lacking. They bring up minerals from below and provide green feed in droughts. Wet, badly drained soils will not grow lucerne. Tahora2, shown here on the right, makes a lot more nitrogen than any other clovers, shown by the dark green.



Over-sowing of the mix will be necessary if parts of the pasture becomes open or trampled. Never use Kopu 1 or 2 because they were bred from an annual so only last about three years.

Human health

Conjugated linoleic acid (CLA, health giving) has received increasing attention in recent years because of its health giving anti-carcinogenic effects. Conventional grain-fed ruminant meat has almost none, while pasture-fed has a lot. The free-range poultry industry should get their eggs and chicken meat tested for CLA and Omega-3 levels compared with grain-fed, which we know has very little. If they have these properties it will be a good selling point. Searching the Net found that some poultry feeds increase Omega-3 levels in eggs, but I could not find any information about feeding pasture to poultry. As they are naturally seed eaters so they will always need some grain.

Avian influenza

In some countries authorities have asked free-range poultry farmers to keep their poultry housed to reduce the chances of getting Avian influenza, but free-range operators have rightly pointed out that their healthier birds are less likely to become infected, and that it's spreading would be slower than in the typical over-crowded housed poultry.

Avoiding food poisoning

All foods need to be handled correctly, and poultry eggs and meat production are no exception. The following rules should be applied.

- Before preparing any food, wash your hands - you may have been touching something infectious.
- Wash egg shells in soapy water before handling and cooking, and wash your hands afterwards.
- Keep raw and cooked items separate.
- Do not use the same chopping board, knife or tools for preparing cooked foods after raw meat.
- Do not place cooked meat back on the same plate or surface it was on before it was cooked.
- After handling raw poultry or eggs, wash your hands and all surfaces and utensils thoroughly with soap and water.

- All eggs and meat should be cooked thoroughly. Egg yolks should not be runny or liquid.
- Don't use raw or soft-boiled eggs in foods that will not be cooked.
- Because influenza viruses are destroyed by heat, the cooking temperature should be 70°C (158° F).

Store all meats and perishables in the fridge at below 5° C or 40° F and never leave them out of the fridge for more than an hour.

For more information on this, see Allergies and Foods in the Human Health folder.

Predators

A neighbour's tame town dog killed our bantams and some racing pigeons in minutes close to our house in Hamilton.

The closer to your home that you position your poultry the safer they will be. A dog could easily jump a fence. If they are closer to your house dogs will be less likely to be so brazen, and you can have your own dog and an electrified wire at 30 cm above ground around them all. It can be stepped over. Once a dog or cat gets a high power shock they'll usually keep away. Even the highest powered ones don't kill unless the subject is entangled for a long time. Avoid using barbed wire because it can cause entangling.

Ducks on Barry Brunton's Waikato beef farm

This photo, taken in May 2008, shows weedy uneven pasture and rough, lustre-less American ducks. Lime had not been applied on the 18 ha lifestyle farm for decades because the fertiliser company sales people claimed it was not needed (they didn't sell lime) as the pH was 6. For four decades nitrogen, superphosphate and potassium was all it got.



Who would have thought that agricultural lime, serpentine and trace elements based on ryegrass mineral analyses, would give feathers with such sheen, lustre and health, to ducks eating only pasture and getting only two kg of maize (corn) daily, with no minerals except what was applied to the soil in the LimePlus.

Look at the even, weed-free pasture with clover now coming through in the foreground. No nitrogen, phosphate or potassium had been applied for two years.

These ducks were free-range, but didn't go more than 50 metres from their pond. They don't fly, so ate only this correctly fertilised pasture and a kilo of maize grain fed by hand each day.

Campylobacter Bacteria

This is a Gram-negative bacteria. Most Campylobacter species can cause disease and infect humans and animals. The bacterium's main reservoir is poultry; humans can contract the disease from eating food contaminated with Campylobacter. Another source of infection is contact with infected animals, which can carry it and cause abortions in animals and food poisoning in humans.

They multiply rapidly in warm, moist conditions. Cross contamination is a known source of campylobacteriosis. It can be easily avoided by following simple food handling tips. Clean, cook, chill, clean hands, defrost frozen foods thoroughly before cooking, pre-cook chicken, meat patties and sausages before barbecuing. Minced meat and sausages should be cooked right through, and pork and poultry juices should run clear - use a meat thermometer to check temperatures.

Use one set of utensils for raw meat and chicken and another set for cooked food.

When cooking or eating outdoors ensure that all food remains covered and cool until ready to cook or eat reheated leftovers until steaming hot throughout and do not reheat more than once, ensure fridge remains

between 2 and 4 degrees celsius keep all perishable foods cold until you are ready to use them.

Use an icepack or chilly-bin to keep food cold outdoors. Ensure raw meat and chicken is properly wrapped to stop drips; also keep raw meat and chicken away from other foods and below ready-to-eat foods in the refrigerator. Cover and refrigerate food as soon as possible after cooking. Throw out perishable foods that you have left at room temperature for more than two hours.

There are many ways you can be exposed to Campylobacter. These bacteria have been found in poultry, raw milk, offal such as chicken livers, and a variety of other foods. You may also be exposed through contact with pets, birds, animals, infected people, the environment itself, and untreated water.