# Chooks & The Choko Tree

## Second Edition

By Nev Sweeney

TABLE OF CONTENTS


| | | |
|---|---|---|
| 1.0 | Introduction | 4 |
| 2.0 | Chook Basics | 8 |
| 2.1 | Breeds | 8 |
| 2.2 | Housing | 9 |
| 2.3 | Feed & Water | 11 |
| 2.4 | Products | 14 |
| 3.0 | Our Chook Journey | 17 |
| 3.1 | The Early Years | 17 |
| 3.2 | Evolution of a Chook Tractor | 20 |
| 3.2.1 | General Comments | 20 |
| 3.2.2 | Chook Tractor 1.0 | 22 |
| 3.2.3 | Chook Tractor 2.0 | 28 |
| 3.2.4 | Chook Tractor 3.0 | 35 |
| 3.2.5 | Chook Tractor 4.0 | 42 |
| 3.2.6 | Chook Tractor 4.0 – Replacing the access | 55 |
| 3.2.7 | Moving the Chook Tractor | 61 |
| 3.3 | The Retirement Village and Other Things | 65 |
| 4.0 | Making Chooks from Scratch | 70 |
| 4.1 | Incubating | 70 |
| 4.2 | Making a Chook Brooder | 73 |
| 5.0 | Making a Simple Chook feeder | 77 |
| 5.1 | Making the small feeder | 78 |
| 5.2 | Making the large feeder | 81 |
| 5.3 | Making a High-Capacity Feeder and Waterer | 82 |
| 5.3.1 | Feeder | 82 |
| 5.3.2 | Waterer | 84 |
| 6.0 | Egg eating in chooks | 86 |
| 7.0 | Resources | 89 |

# 1.0 Introduction

Chooks are the ideal animal for the suburbanite looking for a more sustainable, more self-sufficient lifestyle. They are easy to feed and look after, cheap and easy to get and produce lots of things. There can be surprising psychological benefits as well. Just sitting in the back yard on a summers evening in amongst the fruit trees with the vegie patch on one side and a few chooks pecking about the yard on the other can be very relaxing and a wonderfully satisfying experience.

What Chooks do for you -

**1**. **Eggs** - They will produce eggs, how many will depend on the breed, how old they are, the time of year, etc but they will produce eggs and, with luck, lots of them so if you are going to keep chooks make sure you keep a list of your favourite egg recipes.

Your eggs will also be free of any adulterants. Back in the day, I was at a paper conference in Melbourne and became friends with a gentleman from BASF (they make dyes among other things). In a conversation I had with him he explained that the commercial process of egg production is so rough on the chooks, the egg yolks come out white. His job was to go around to the egg producers and help them work out how much dye needed to be added to the chook feed to get the desired yolk colour. He even showed me the colour card they used. Shortly after that we got our own chooks.

**2. Cultivate the soil** – chooks love to scratch and to dig the soil, this can be a good thing if it is done in an authorised manner by keeping them in a chook tractor as we do, more on that later. It can be a neutral thing if the chooks stay in the run or area you have prepared for them, or it can be a bad thing if they cultivate in an 'unauthorised manner' ie they escape and buzz cut your veggie patch down to ground level in an amazingly short amount of time. Whatever you do, chooks will dig and scratch and you need to be aware of that and be prepared to use it or at least contain it to areas where they won't do any damage.

**3. Produce manure** – Again this can be a blessing or a curse but if you grow your own veg it will be a blessing. If you use a chook tractor the chooks will, for the most part, distribute and dig it in by themselves, one of the attractions of the chook tractor idea, but if you use the standard chooks shed and run, you will need to collect and distribute it yourself, whether to you own plants or by passing it on to gardening friends.

**4. Entertainment and companionship** – as mentioned above, it is great to just sit and share your backyard with your chooks, or to watch their antics as they go about their day doing 'chooky' things. Also, while chooks may not be scintillating conversationalists, they are great listeners. They also add a sort of 'aliveness' to your place. Back in the day I was going to Europe with my family for Christmas but they had left three days before me, we were going to be gone fo over a month so the chooks were being sat by some friends, and it was an interesting feeling to be in the backyard without the chooks. Amazingly enough it felt dead without their presence. Just sayin'.

"Hey! Hey! Got any chook treats?"

**5. Meat** – you can produce your own meat if you have a mind to, whether by raising a breed or crossbred chook specifically designed as a meat chook or by raising a 'dual purpose' breed and then eating them at the end of their laying lives. I have despatched and prepared chooks for eating but I can't say that I am particularly comfortable with it, but on the other hand you can give them a good life, with one bad day at the end. Either way it is personal choice.

**6. Feathers** – every year in autumn all of your chooks are going to change their feathers, it may quickly or slowly, but each bird will totally replace their entire covering of feathers. So do you want to fool around with quill pens, or perhaps stuff a pillow or comforter (depending on how many chooks you have)? In any case, feathers are a great slow release, high nitrogen fertiliser for use in the garden.

**7. Carbon dioxide** – OK, this one may seem a little bit 'out there', and while I have read about it I have not tried it myself. If you grow food, or anything else for that matter, in a greenhouse, by allowing your chooks to spend some time in there the CO2 they respire can build up and encourage faster plant growth rates.

**8. Ethical actions** – If you have ever seen how chooks are factory farmed (for meat or eggs) you will be aware of just how nasty, brutal and short their lives are. Raising and keeping your own chooks ethically in your own back yard means they will have a better life and you will not be supporting a cruel system.

Keeping chooks is a wonderfully productive and fun enterprise. Check with your local council to see what sort of restrictions they have in place because it is important to know what is required for the legal license. It is more important, however, to maintain the social license ie not to crap off your neighbours. We have never had a problem but a few eggs here and there can smooth the way.

As a sample, these are the sorts of restriction you will likely to see put in place by your local council, but they could vary so you still need to check –

- No roosters (this is common in most urban and suburban council areas)
- Maximum 6 to 10 chooks
- You must manage odour, noise & pests, this will also assist with you maintaining the social license.
- The poultry shed must be paved and/or 15.2m from your dwelling
- The poultry yard must be enclosed & cleaned regularly

## 2.0 Chook Basics

## 2.1 Breeds

The trouble with many city or suburban locations there is not enough space to keep full size chooks and still remain within the council regs you should check with your local council about this. One possible way around it is to keep bantams which may be classed as caged birds and so the space rules may not apply. They are good layers but tend to go broody in summer, good if you want to raise chicks bad for eggs as they stop laying. If you want to raise chicks you will also need to keep a cockerel, but due to their crowing this can make you unpopular with the neighbours and most suburban councils prohibit them being kept in backyards. Hens do not need a rooster to produce eggs, just to produce fertile eggs.

Bantam breeds mirror larger breeds but there are also breeds which have no large counterpart. In my experience (which I must admit is not vast in this area) the variation in laying capabilities seems to vary with individual birds rather than breeds. So you might go through a few birds to build up a flock of good layers. The carcass tends to be small but is well covered with meat for its size, so bantams can be used for egg and meat production.

If the size of your yard allows for the keeping of full scale chooks (or you choose to ignore council regs. If they apply to your situation) the cheapest and easiest way to start out in poultry is to buy a few "spent layers" from an egg farm. These are crossbred chooks that have been specially designed to pump out eggs. They have already been

laying for a year at the farm and as their egg production falls off in the second year it is considered better economics to restock the farm at this point (ie turn them into chicken nuggets) . For the backyarder who doesn't have such economic restraints this is not a problem and spent layers may continue to lay for a number of years afterward. They are relatively cheap, but it can be a bit of a lucky dip as to how many eggs you get out of each bird.

It is also nice to show the chooks that there is a world outside their battery cages. Spent layers will also have the end part of the top of their beak cut off (to stop the bored crapless birds pecking each other to death in their cages) and this can interfere with their foraging.

For all their sterling qualities crossbred chooks are egg layers not meat producers, this is especially so of spent layers. So if you want to eat your chooks as well as get eggs off them it would be better to go for one of the so-called "dual purpose" breeds such as Australorp, Rhode Island Red or the Light Sussex. These breeds can be used to produce eggs for a year or two and then eaten. My preference is the Rhode Island Red because along with everything else they are quite attractive birds. Having said that we have had both Australorp and Rhodies here for many years and like both breeds.

## 2.2 Housing

Housing can be as simple or as complicated as you like it. There are four main types:-

**1. Movable bottomless house also referred to as and ark or chook tractor** - this is moved frequently from one area of

lawn or vegetable patch to another so they crop the grass, fertilize it then are moved on.

**2. Free range** - This is the system that I use in that the chooks have free access around the back yard, but the vegie patch is fenced off from them. They have a permanent "hen house" which they return to at night.

**3. Permanent run** - Where the chooks are confined to a house and non - movable run which tends to become denuded of grass rapidly. You need to provide them regularly with green feed to keep them healthy.

**4. Deep litter**: This is ideal for very small areas as the hens are kept inside in a deep litter house. The floor is covered with minimum 30cm of dry material eg straw or rice hulls which the chooks dig and turn over. This absorbs their excreta and at the end of its life (about 12 months) is a very rich compost.

We have a combination of chook tractor and deep litter systems in operation. We get in day old hen chicks (2 x Australorp and 2 x Rhode Island Reds) from a local supplier and put them in a brooder and raise them until they can go into the chook tractor. They spend 2-3 years in the chook tractor being rotated around the veggie beds and having the time of their lives. Once their egg laying starts to taper off you would think we would eat them, but instead they go into the "Retirement Village", a deep litter containing shed that has the floor covered with locally grown grass hay. They turn the hay over, eat the seeds and some of the foliage, manure it and turn it into mulch which is then used on the veggie beds so that while we get very few eggs from them, they are providing a useful service. I have also set up temporary runs in places such as under the mulberry tree in spring so they can clean up the fallen fruit.

Whichever method you choose the chickens should have a rainproof, wind proof yet airy place to sleep. For each chook in the "house" there should be 20cm of perch space and one nest per 5 birds. If the birds are to remain inside there should also be 1.5 square metres of floor space per bird. Our chook tractor provides about 1 square metre of floor space per bird, but gets moved to a different area every two weeks.

The house can be fancy or basic, I built my original one from an old recycled plywood packing case with a shelf running along one side for a nesting area and a broomstick fixed up above and to one side of the shelf as a perch. It lasted a good 15 years. At the very least it should be easy to clean, I use straw on the floor and in the nests and change both 4 times per year, it makes excellent mulch or fertilizer. When the house is cleaned out it should be inspected for parasites and thoroughly gone over with derris dust if required. The perch can be painted in sump oil/turps mix to discourage parasites.

We do not have problems with rats but if you do the floor of any permanent houses should be concrete. Any movable runs should have wire netting floors to discourage predators. If you have a dog and he gets on well with the chooks (mine did) predators should not be a problem.

## 2.3 Feed & Water

To produce eggs chooks need water, access to cool clean water is a prime necessity for decent egg production especially in hot weather. Open containers will work but tend to get soiled easily so a commercial or homemade waterer is best. This can be made by fixing an upturned bottle in a tray and then suspending the whole contraption 50-75mm off the ground. The bottle is filled with water and then upturned into the tray. The mouth of the bottle should be so positioned as to allow the tray to fill but not over flow. This will keep the chooks supplied with water for days or weeks depending on the size of the bottle and size of the flock. If they free range over a large area you may require several waterers.

Here we will mainly consider the feed needs of adult birds, see the article on raising chicks for details on their needs.

**Mash or Pellets**

These are commercially available feeds, I find the mash difficult to use and store and much prefer the pellets. They contain nutrients to cover most of the birds needs and are easy to store and feed to the chooks. I made a feeder by cutting both ends from a dog food tin and then attaching a rusty "vacola" bottling set lid on the bottom with about 12mm overlap all the way round. Full of pellets this lasts our 4 chooks for a few days.

**Grain**

This is slow release chook food as it is digested only slowly. A few hand fulls of grain before bed-time lasts them all night. I use wheat, corn and sunflower seeds and got no complaints from the chooks. If you want to give them an extra lift the grain can be sprouted before giving it to them, they love it. You and also grow some of your own grains, sunflowers work well, to increase the sustainability of your chook flock. Feeding unprocessed grain to your chooks can cause problems if you keep them in a chook tractor because some of the grain always escapes and you can wind up with wheat in your carrot patch or sunflowers growing in amongst your cabbages. This may not be a problem for you but if it is consider running the grain through a grain mill or blender to chop it up a bit first. Sprouted grain can also give chooks a bit of a vitamin lift in winter.

**Green Feed**

If the birds free range they will not need much extra green feed but if kept on deep litter they will. Under any circumstances chooks enjoy fresh greens so outer leaves from the cabbage or lettuce are well received and I grow one or two silver beet plants in a corner of the vegie patch for them. They also appreciate lawn clipping and some green weeds such as wandering Jew; fat hen; dandelion or dock will really go down well (literally!).

**Scraps**

Chooks will devour most meat and vegetable scraps but do not give them cooked food that is likely to go "off". This will make them sick as readily as you or I. In our place there tends to be a three way tug of war between the worms, compost bin and the chooks for any scraps or peelings. The worms do tend to win, but the chooks put up a pretty good fight.

**Shell Grit**

To produce egg shells the birds need a constant addition of calcium to their diet. This can be shop-bought shell grit (gasp shudder!) or pick some up next time you are at the beach, make sure it is well washed to remove the salt. According to the books you should not feed chickens egg shells unless they are cooked first by heating up to remove any eggy taste otherwise it encourages them to eat their own eggs. In practice my hens do not get bored enough to try this little stunt and I have been feeding them untreated egg shells for years with no problems, so long as the eggshells are crushed up and not recognisable as eggshells.

**Hard Grit**

The birds require small stones which they swallow into their crops to grind up their food (chookie equivalent of teeth) so granite chips or equivalent should be available. Of course if the hens can free range or are in a chook tractor they will pick up small stones as they peck and scratch.

## 2.4 Products

**Eggs**

Being basically a city lad and conditioned by years of cartoons I thought a hen just sat there and laid eggs by the dozen. It was quite a shock to learn that they only lay once every 25 hours, so that every so often a hen will miss a day. They will also go broody and try to hatch their eggs, particularly in hot weather when they have a clutch of eggs to sit on (note to self: collect eggs every day), if they do go broody (sit on eggs and won't move, make "gluck gluck" noises and peck at you if you try to move them) put them in a cage that does not have any dark, quiet corners they can "nestify" but make sure they have easy access to food and water. After a few days they will return to normal.

Hens will go off the lay during winter and at peak times you will probably have too many eggs (eg in early spring) so they can be preserved using one of the following methods –

VASELINE - A coating of odourless Vaseline (not vicks) will seal the egg and increase it storage life.
LIME - Make up a slurry of 20 parts hot water and 4 parts lime (calcium hydroxide or builder's lime) and 1 part salt, allow to cool. Place the eggs in a jar or crock and cover with the solution.
WATER GLASS - (Sodium silicate solution) add sufficient water glass solution to water so that the eggs will just sink. The eggs can then be preserved in a jar or crock provided the eggs are wholly covered with solution. They may be preserved for up to 12 months in this way.

Or you could boil and pickle them!

**Manure**

If you keep chooks your vegie garden will love you for it! You should design your hen house so that it is easy to harvest this valuable high nitrogen resource. The uninitiated will think you are only cleaning out the chook pen but we know what an important job you are doing! Of course if you have a chook tractor the chooks will deposit directly onto the area to be fertilised, thus saving you considerable work.

**Meat**

Killing and dressing - bantams tend to become part of the family (could you eat your best friend?) so if you do intend to ingest them at any stage avoid the temptation to give them names and turn them into pets. Having decided that you can eat your best friend you should proceed in the following manner: To kill - you can either use the tried and true hatchet method. This requires two people one to hold the chook the other to use the hatchet, or use the neck dislocation method. This still requires the head to be cut off so the bird will bleed so I don't see the advantage. Be that as it may to dislocate a chooks neck hold its head in your right hand and feet in your left. Hold the chook head down diagonally across your body and turn its head upwards so that the neck forms a vee with the body. Then stretch the neck very firmly downwards, but beware, too firmly and you decapitate the chook, a most un-aesthetic thing to occur when you are not prepared for it.

TO PLUCK - Now dump the corpse into a bucket filled with water at 66oC, Agitate to ensure the water gets to all parts of the chooks body. The chook need only remain submerged for a minute or two then hang the bird up and pluck. Retain the feathers if possible as they can be washed and put into pillows or composted to provide more a high nitrogen fertilizer. If buried uncomposted they can be used as a slow release fertiliser.

TO DRESS - Cut off the head and push your finger down into the chest cavity through the neck and run it around inside to sever the ligaments. Then cut around the vent

(cloaca; anus) and tie it off or hold onto it. Move your hand into the abdomen and remove all the internal organs, be careful not to tear the gut. Retain the heart, lungs, gizzard and liver as these are edible. The kidneys may have remained in the body cavity, so inspect and remove them if this has occurred. The bird may now be tied up for boiling or roasting or cut up so the pieces can be cooked separately.

## 3.0 Our Chook Journey

## 3.1 The early years

We first got chooks back in the late 1980s, I had wanted to give them a go for a while but the catalyst was our youngest daughter having food issues, particularly with colours and flavours. This caused us to rethink our diet and since anything but cage eggs were difficult to come across in those days, we started looking into keeping our own. I had been to a conference in Melbourne and met up with a guy from BASF, he showed me a colour card and explained one of his duties was to go and see egg producers. It seems that the cage system was so rough on the chooks, their egg yolks turned out white, so he sold them dye to put in their feed, the more dye, the deeper yellow the yolks were. The colour card helped you work out how much dye to put in to get the shade of yellow you wanted. We haven't bought caged eggs since.

Our first chooks were bantams, about half a dozen of them, which I had bought because I was under the impression that while full sized chooks were livestock, bantams were regarded as 'caged birds' by officialdom and so acceptable in the back yard. This turned out to not be the case but it was what I believed at the time. I had been doing some work with a glasswool insulation manufacturer and they got their glass beads (which they melted to make the insulation) in 1200mm plywood cubes which they would dump. They kindly dropped 3 off at our place, one for the chooks and two for a cubby for the kids.

To make it habitable for chooks I cut a small door in the front of the chook cube (but still big enough for me to climb into), a chook pop hole in the side and put up a shelf as a laying platform and a length of broom handle as a roost. To make it more weather resistant I built a corrugated iron skillion roof and then built a two metre by one metre run outside the shed part. The run was obviously too small and didn't last long, I ran some chook wire from the back fence, along past the chook shed and around onto the side fence, giving the chooks a run of around 25m2 instead of 2m2. Mind you, the guy we bought them off was over near Sutherland and had what looked like a hundred chooks in small cages lining the inside of a garden shed. I think the chooks were just glad to get out!

They were quite productive for us, but they did not live forever and when they started to pass we looked around for some replacements, full size this time. We got some spent layers from one of the local egg farms. Commercially, once the chooks have laid for a year they are replaced because production drops, and you can occasionally pick some up cheaply as we did. They had never seen what the outside world looked like and I remember placing them in the chook shed and watching as they stuck their heads out and looked very distrustfully at the grass, probably thinking 'what on earth is that green crap???'. Yet within a few hours they were out pecking and scratching with the others, exhibiting all that wonderful chookie behaviour. They were not only cheaper but we had the built-in satisfaction of rescuing them! The only real issue was that they were beak trimmed (all commercial layers are) and this did interfere with their ability to forage a bit.

I wound up fencing the veggie patch to keep them and out and then letting them out to free range in the afternoon, very relaxing for them and for us watching them. The chook fencing around the chook pen and around the veggies was only a metre tall so a chook could in theory fly over them, thus I had to trim one wing of any and all new chooks to keep them in. The interesting thing was that once the wing had been trimmed they got used to the idea that they couldn't fly, even once the feathers grew back at then next moult and they didn't even try.

We kept that process going for over 10 years and while it worked well in terms of egg production it did have some significant downsides, one I didn't discover until we moved on to the process we use now. Those downsides were –

- Every couple of months or so I would have to climb inside the chooks shed and remove all the chook poop and distribute it around the veggie patches. This was NOT my favourite job!
- We were feeding half the local bird population. I didn't realise until we enclosed our chook operation and the usage of chook feed dropped by about half!
- While these wild birds loved the cage food, they also left my chooks a gift that keeps on giving in the form of mites. A short conversation with Mr Sulphur Powder and the mites mysteriously disappeared.

## 3.2 Evolution of a Chook Tractor

### 3.2.1 General Comments

As I have mentioned elsewhere, I have never claimed to be the sharpest tool in the shed but I do know a good idea when I see one, and my world changed when I came across the concept of the chook tractor! I found out about chook tractors through Bill Mollison's permaculture work somewhere between 15 and 20 years ago and as soon as I saw it I knew I had to have one!

The advantages of a chook tractor were –

- It would allow me to make the best use of the chook poop by having the chooks directly apply said poop to each veggie patch in turn,
- Their scratching would shallow cultivate each patch, after which I would apply mulch and the worms would come up to the goodies on the soil surface and finish the job. No more rotary hoeing or double digging for me!
- The chooks were isolated from the wild birds thus solving the second and third issues referred to above.
- Due to their constantly being moved onto new ground, there was less likelihood of the chooks suffering from a build-up of pests or diseases.
- The chooks could make use of leftover vegetable and weed trash and harvest any residual snails, slugs and other bugs thereby reducing my workload and improving their nutrition.
- It looked great! By this time the old chook shed, Which was designed for a one way trip to Aust. full of glass beads, was now over 10 years old and looking pretty shabby so the chook tractor was a marked improvement.

Of course the chook tractor would also impact on how we grew our veggies. Originally I would just move the tractor around the several large beds (4m x 4m and 6m x 6m) we had at the time but I wound up dividing each veggie patch into beds 1200mm by

2000mm, which coincidentally is the footprint of the chook tractor! I have since increased half of the beds to 3000mm long.

### 3.2.2 Chook Tractor 1.0

I needed to work out a design for it and spent some time agonizing over the form it should take, intending to draw up plans to build it from. After supreme procrastination, I decided just to go ahead and build the damn thing!

I had an old pine bed base that was due for the scrap heap, and so used that as the raw material for the structure but needed to get hold of some plywood to make the sides. I still had some chook wire hanging around and some lengths of dowel I could use for perches so I was pretty good to go.

I decided to make it an A-frame shape for no better reason than I liked the look of it, the base being about 2 metres long by about 1.2 metres wide and the sides being about 1.6 metres wide giving the whole assembly a height at the apex of the A-frame of about 1.4 metres. One end and one half of the tractor were covered with plywood sides to provide shelter from the weather and a roosting area under cover and the other half and end was covered with chook wire for ventilation and sun.

About half way up the closed end I put in a shelf as a laying area for the chooks and the enclosed and had two full-width doors built in, the top one giving access to the laying area, the bottom one giving access to the rest of the chook tractor including the food and water dispensers, which were hung from the bottom of the laying area floor. There would be no floor on the tractor, of course, to allow the chooks to scratch, dig and destroy to their hearts content…….within the confines of the tractor!

**Construction begins!**

I cut up the main bearers of the bed frame to make the 2m x 1.2m base of the tractor and screwed it together. Next I grabbed six of the slats and cut the ends off at an angle so that they would form the uprights of the A-frame, one set at each end and one in the middle. I used another of the slats to form a ridge timber at the apex of the A-frame, and then screwed all of the timbers together, forming the basic frame of the tractor. To strengthen the A-frame I put a small triangular gusset of plywood on the outside top of each of the end A-frame.

To form the roosting area I got hold of some plywood (exterior grade) but I didn't have enough to go all the way down to the base, not to the top of the A-frame so I screwed it

onto the uprights leaving a bit of clear space at the top and bottom, then bought some “Miniorb” corrugated iron with small corrugations from Bunnings and cut it to size with my angle grinder. I bent one piece over the top of the A-frame and screwed it to the plywood, forming a water-tight cover and screwed the two other pieces to the frame on one side and the plywood on the other, finishing off the covered area. To make the initial bend was easy but it needed to go over to quite an acute angle to cover the top of the A-frame so in the end I had to jump on it to get it to fit!

I put a brace cut from one of the slats on the covered end of the frame and screwed it into place, I put handles on it and it would be one of the lifting points for transporting the tractor between veggie patches. I then cut some more of the exterior grade plywood to make the large lower door and the smaller upper door giving access to what would be the laying area.

I had some 12mm thick MDF (medium density fibreboard) so I made the floor of the nesting area out of that, screwed on a support on each side of the plywood walls and then screwed the floor onto the supports. I originally made a sort of cut-out door area to screen off the laying area a bit (visible in some of the photos) but after having troubles enticing the chooks into the laying area I removed it and never bothered to put it back on. The laying area only took up about half the length of the covered in space, so I screwed in two lengths of dowel across the A-frame onto the support timber to act as roosts. The chook tractor originally had 6 chooks in it and the size of the roosts seemed to do the trick.

Returning to the “back doors”, there are times when my woodworking skills …….ahhhh, leave a bit to be desired, so when I measured up the open end to make the doors I found that the angles were a bit off and had to specifically cut the doors to fit the measured opening, rather than what the opening was intended to be. The moral here is, as always, measure twice – cut once, not vice versa! I had some mild steel hinges and used these to hinge both doors so that they opened down. While the system worked, it was a pain to use if the covered end of the tractor got too close to a tree or fence or other obstruction. I used a magnetic catch to secure the top door, the smaller of the two, but when I tried the same trick with the bottom larger door, there was too much mass to be restrained by the small magnets, so I wound up opting for a hook and eye system. I only put a hook and loop on one side, but it worked pretty well.

It was a simple matter to drill two holes in the floor of the laying area and install two eye bolts side by side so that I could hang a water container off one and a feeder off the other. All that remained was to cover the open end of the tractor in a layer of chook mesh and I did that by first folding a sheet of mesh the right size over the top and then screwing it to the inside of the plywood covering and the bottom base. I then cut a sheet into the shape of the A-frame end but leaving it a little oversized, I secured it by placing it against the open end and folding the protruding wires over the chook wire already in place on the A-frame.  Once the wire was secured I screwed in a handle on

each of the uprights at the open end to form the other lifting point for moving the tractor.

To finish off I did lacquer the plywood sides but I didn't apply any form of coating to the rest of the tractor. It did its job very well but was somewhat over designed and rather heaveeeeey, so that when my daughter and son-in-law moved out, one of my primary power sources for moving it was lost. It was just too heavy, even on the light end, for my wife to help me move. Not long after that though, it reached a state of decay where it threatened to no longer contain the chooks, which would have allowed them to terrorise the rest of the veggie patches. So after 5 years of faithful service it went to the great chook shed in the sky, lasting just long enough to allow me to build a lighter and more manoeuvrable chook tractor.

### 3.2.3 Chook Tractor 2.0

When we last saw our hero, the old chook tractor (see previous section) had died and he needed a new one.....quickly!

All melodrama aside, here is what I did. In many respects it was similar to the old one, it was A-frame in shape and had a footprint the exact size of most of our veggie beds, but it also had some significant differences –

- It was built of much lighter materials so that it could be easily shifted by two people, even if one was a short and lightly built (but enormously cute) female.
- Rather than have an opening on one end, the inside area is accessible through a hinged panel running the length of one side.
- There are two nesting areas rather than one.
- It is painted all over to extend its life.

The main part of the A-frame is constructed from DAR pine that is 70mm x 19mm because it is light, cheap and easily available, and this is how I made it –

1. I set out the base to be 1975mm long by 1310mm wide, using some steel angles to attach the four members and form the base. I cut four more members to 1490mm long and trimmed the ends to the correct angle so they could form the A-frame ends. I attached them to the base and together at the apex by using some light steel braces and screws. A ridge beam of the same size pine was screwed into the apex of the A-frame through the brace and the basic shape was complete.

2. To brace the structure and provide a base to attach the laying areas and perches on, 730mm up from the base along the A-frame uprights I put in a 70mm wide by 19mm deep cut out in each of the uprights to allow me to fit in a mid-rail. To make the cut-outs I just drew the measurements onto the upright, cut 70mm in with a tenon saw and then chiselled out the waste. I could then fit in the brace and screw it in to secure it. At the same height I put in a timber brace on each end to take the lifting handles.

3. Using the same process, I put in another brace 460mm above the first one so that I could attach the peak cover. To make the peak waterproof I didn't just want to form a timber peak and then seal it, I got hold of some colourbond mini-orb that I could get cheaply, the sheet was 2 metres long by 1 metre wide, so taking my angle grinder with a cutting blade (wearing eye and ear protection of course) and cut 400mm off the width of the sheet. This would cover the entire length of the tractor and (when bent in half lengthwise) extend 200mm down each side, giving a waterproof peak to the tractor.

4. I could then start to fill in the structure around the laying area. I did this by screwing 3 ply to what would become the back side of the tractor to the top and bottom braces as well as the sides of the A-frame. I then cut some plywood to fit the top part of the A-frame ends and screwed that into place. After having lots of fun trying to bend the

mini-orb to the correct angle to go over the top of the A-frame (it took two of us jumping on the damn thing to accomplish it) I fitted it in place and screwed it down.

5. I then fitted the floor in each end of the covered area to act as laying boxes by cutting two squared of 5 ply 500mm long x 600mm wide, then cutting out a 19mm x 70mm notch in each rear corner to allow the floor to sit back all the way to the rear of the nesting area. To attach the ply to the mid rail I used four small L-shaped steel brackets, bent into an acute angle so that they fitted flush onto the slope of the mod rail. Four screws, two into the mid rail and two into the base itself secured the bases to the mid rail.

6. Next came the perches, two of which were made out of a length of recycled broom handle, attached to the mid rail by an electrical conduit clip screwed onto each end, a notch had to be cut in the angle of the mid-rail to allow the perch to fit solidly.

7. Before fitting in the main access door I had to fit the chook wire around the open bottom of the tractor. Using side cutters I cut the wire to side for each of the four openings (2 x sides and 2 x ends). The wire is quite sharp, and you might want to use gloves to prevent unnecessary damage to your hands and prevent your kids learning

any bad words before they absolutely need to. Once cut to shape I pulled out a stapler I'd been given and using some long, U-shaped staples I attached the wire to the tractor framework.

8. Once the rest was assembled I could put on the access door. This was just a piece of 3 ply 2000mm x 500mm that I attached to the top rail by three small hinges, which proved to be totally inadequate for the job, *sigh*. After they gave up the ghost, I did what I should have done in the first place and used a 1500mm length of piano hinge that I had floating around the garage.

9. The tractor was now complete except for a coat of lovely British racing green paint so that it fits in with the rest of the back yard and I placed a ring bolt on the underside of the centre of each laying platform, to which a feeder and waterer are attached.
The chooks seemed excited to be in their new home, well as excited as a chook can get I suppose. Originally the tractor held four chooks, two Australorp and two Rhode Island Reds, but with the passing of one of the Austrlorps there are now only three although they still seem to be capable of mass destruction in their allotted two weeks on each patch and we still get plenty of eggs.

One difficulty that has subsequently surfaced is that if something panics the chooks and they squawk and flap everywhere, the top of the wire netting can come loose and let one out, requiring the wire to be re-attached more firmly by small nails. While I was striving to be as light as possible, a more substantial attachment for the wire is a good idea.

The new one is considerably lighter than the old one but my lovely partner in the sustainable life still has a bit of trouble with it, so we have evolved a technique where she gets one end with a trolley and I lift the other end. It gets us where we need to go. I have considered attaching wheels but more often than not the tractor is shifted sideways to the next veggie bed (which I can do by myself) and the wheels would be more a hindrance than a help, but your set up will be different and you might want to think about adding wheels.

.

### 3.2.4 Chook Tractor 3.0

I hoped that the previous incarnation of the chook tractor would last us a while but after 5 years of sterling service in all weathers it was losing its war with wood rot and moving it from patch to patch was becoming more and more of a juggling act. I was at work and Linda was trying to harvest some eggs from the tractor when there was a catastrophic failure. Damn, so much for the weekend, I knew what I would be doing. I try and make each iteration of our design better than the last by building on the mistakes of the previous one, so in other words I try not to make the same mistake twice.....I make a whole stack of new ones each time!

The improvements to this one over the last one are –

**All over paint job** – The original got a bit of varnish over the main sides, last one got several coats over all of the outside but after coming up short due to rot in several areas, this one got three coats all over, inside and out.

**White, not green** – The previous chook tractor was painted Heritage Green (looks something like British Racing Green for those who remember it) and it looked pretty

nice in the back yard. Unfortunately, being a dark green it did little for the chooks comfort on the hot days that can hit us anywhere from October to March. You can feel the difference on the inside of the covered area just by putting your hand on the timber surface, warm instead of ouch!

**Extended side** - The last unit, to save weight, hat the top roosting area covered by plywood but the understory was completely surrounded by chook wire. Again, on those really hot days we had to provide extra shade so this one has the side that does not open extend down to within 100mm of the bottom of the tractor. This still allows some ventilation but with that side facing the west and being painted white means a more comfortable summer for the chooks.

**Aviary wire instead of chook wire** – both previous versions of the chook tractor had (predicably enough) standard chook wire mesh (hexagonal 50mm holes) but no lesser authority than **Dr Harry** himself said that the chooks can get their heads through this and injure themselves. This version has aviary mesh with 13mm x 13mm square holes which is stronger and the chooks can't poke their heads through.

**Redesigned access hatch** – the original was made out of just 6mm 3 ply and had a tendency to curl up at the edges in hot weather, with the possibility of a chook escape. The new one is still 3 ply but only 3mm (it was all I had to hand) so I have built a frame of 70mm x 19mm pine that will keep it rigid, around the inside. So, the frame keeping it straight and the white paint coating it will prevent any deformation. Also, I have beefed up the piano hinge that acts as a pivot for the access hatch and for further strength the screws securing the piano hinge go into the full thickness of the frame rather than just the 6mm of the hatch itself, as it did on the previous model.

**Thicker roosts** – up from 15mm to 20mm, the thicker roosts are more comfortable on the chooks feet (and it was what I had).

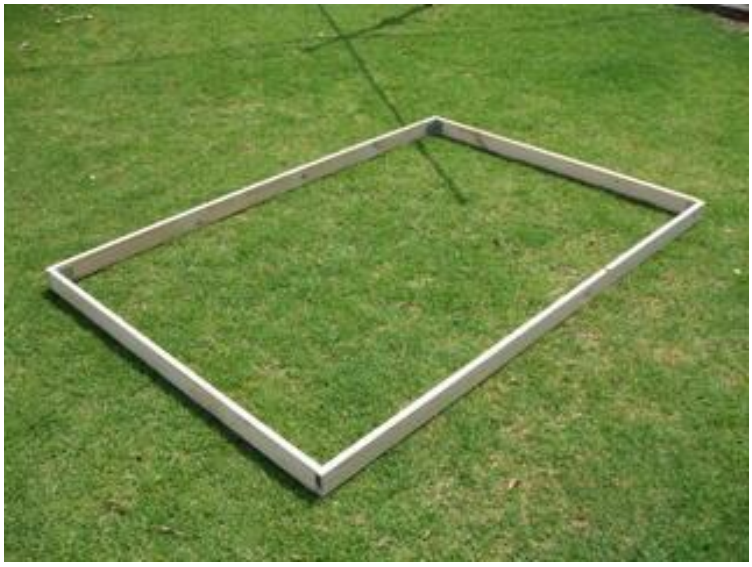
**Shorter body** – The previous incarnation was 2000mm long exactly because this simplified construction, a lot of the raw materials coming in 2 metre lengths, but when I

came to use it I found it was in fact just a shade too long, so the new one is 1900mm and fits the beds a treat.

Apart from the above differences, the chook tractor is essentially similar in design to the previous one, using the same materials and construction techniques. The construction sequence, for those who missed it, is

- Lay out the bottom rectangular footprint and secure with angle brackets and screws
- Attach the A-frame uprights to the bottom footprint with flat steel brackets and screws.
- Fit the ridge member and screw in the ends to keep the A frames upright.
- Cut the timber to go along the sides to length and then cut out the A-frame sides to fit and screw them in
- Cut the end pieces to be used as handles to size and screw them to the A-frame uprights
- Cut out the back and side covers from plywood and screw them to the frame
- Cut and install the perches
- Paint the living daylights out of everything with 2-3 coats of white paint
- Make the hatch and paint white
- Install the laying areas
- Put the hatch on with piano hinges
- Put the wire on by screwing timber to the uprights and using staples on the edges.
- All finished!

So far it is working well, containing the chook effectively and they are much more comfortable, or so they tell me. All up this one took me about two full days (with help from son-in-law and wife) and cost in the region of $200 but it would have been less if I was able to use more recycled content.



Alas, it was not to be and after 5 years of constant use, it also fell apart due to rot.

### 3.2.5 Chook Tractor 4.0

If you read the section, you will know how happy I was with the design and you must be wondering why I would need a 4G if the 3G was so good. Well, one of the improvements of the 3G over the 2G was that all the wood bits got 3 coats of white paint to keep out the weather, and the rot. Unfortunately, even with all the extra work the service life was still only 5 years, which is not good enough! I had to do better.
The reasons for using wood in the first place were that it was cheap, available, comparatively light and most of all, I was confident working with it. Its major drawback was its lack of permanence, even after 3 coats of paint which proved to me that a new approach was required!

I happened to have a few 6.5 metre lengths of 25mm x 25mm x 3mm thick aluminium angle floating around from a previous project (OK,OK I bought the wrong size and never got around to taking it back….. happy?). While I was not hugely confident with it I came up with a design that would work, and I had my secret weapons – pop rivets!

**Constructing the Frame Base**

The first section which I made was the footprint of the tractor – a rectangle 1800mm x 1200mm. The idea was to cut out a 90° angled wedge of aluminium at each of what would become the corners, then fold each angle around to make the rectangle. I took one of the 6.5 metre lengths and made a pencil mark at 1800mm then 3000mm, 4800mm and then at the 6000mm mark. I got hold of a rectangular sawn timber offcut and used one of the corners as the 90° angle, holding it so that it was at 45° to the straight, then ran a pencil down the side of the timber to make a mark at the 1800mm point. I then used my hacksaw to cut out the 90° wedge of aluminium I had marked out. This allowed me to bend the aluminium into a 90° angle, two more cuts at the 3000mm and 4800mm meant I could bend the rest into the desired rectangle and then cut off the excess 500mm at the 6000mm point and then pop rivet the open ends together to form a solid rectangle.

**Pop Rivets**

A word or two about pop rivets: if you haven't come across them before, pop rivets look like tiny little swords (which I used as such when I was a kid), where the "handle" of the sword is fitted into a pre-drilled hole in two bits of metal. The "blade is then fitted into a pop rivet gun and the handles of said gun squeezed together. This pulls the handle down and deforms it so that it compresses into the two pieces of metal to be joined and holds them together. Further pressure on the handles cause the blade to snap off, leaving the handle in the hole, fixing the two pieces of metal together permanently.



I have lots of pop rivets hanging around but they turned out to be too short to go through two thicknesses of 3mm aluminium angle, so I had to go out and buy some

larger ones. The ones I got had a grip (length of the handle) of 9.6mm and seemed to do the job. The shank was also somewhat thicker than the ones I was used to, which meant that it took more effort to squeeze than handles of the rivet gun together to break off the shank, although this also meant the finished job was a lot stronger.

**A-Frame ends**

This part required four pieces of angle aluminium 1500mm long which will have one end fixed to the frame base and the free ends attached to each other to form the A. At the top of the A-frame the two parts of the frame meet at quite an acute angle, so the ends need to be cut back to allow them to come together at the top to a point. I tried using a pair of tin snips for this but the 3mm angle was too tough to cut so I went back to using the hack saw. The A-frame sections were attached to the base frame at the bottom and each other at the top using one pop rivet in each location.

With the A-frames in place it was time to put in the ridge cap. The sides of the aluminium angle are at 90° to each other, but the angle at the top of the A-frame was much more acute than that (closer to 60° in fact) so to ensure a good fit, I squeezed the ends of the ridge cap in a vise until they more approximated the angle at

the top of the A-frame. The ridge cap was then fixed in place with a pop rived in each end.

**The Mid-Rail**

With the basics of the frame in place it was a simple matter to put in the mid rail, cutting the aluminium sections to size using the hack saw. I also chamfered the ends of the sections going into the ends of the A-fame so that the angles were the same, allowing a better fit. This was also done with the hack saw. The distance between the bottom of the mid-rail and the top of the base is 750mm on the large front and back panel and 670mm on the side panels, the difference being due to the angle of the front and back panels.

**Wire Mesh**

With the mid rail in place I could then affix the wire mesh onto one long side and both ends, allowing the fourth side to remain wire free so that I could cover it with marine ply to provide shade from that direction. I got hold of a 5 metre roll of 900mm wide wire mesh with 25mm x 25mm meshes. Using a pair of side cutters I cut a length off the roll and trimmed it to size. I bent the bottom to a 90°-ish angle to fit into the base aluminium angle then wrapped the top mesh over the mid-rail. To affix the sides to the tractor and hold the whole thing taut I got hold of some 1mm x 25mm aluminium flat bar, placed it over the wire and then pp riveted it onto the aluminium A-frame. I followed the same basic idea for the sides.

**A-Frame Infill**

The meshed area is for ventilation, but there needs to be a covered in area for nesting, roosting and laying so to start that I got hold of some 4mm marine ply. Regardless of paint, if you use normal plywood it will delaminate over time due to rain dissolving the glue holding the laminations together (don't ask how I know….), but marine ply uses a waterproof glue. I designed it to fit inside the A-frame for strength.

I took the measurements inside the A-frame and transferred them to the plywood sheet in pencil, for ease of use I decided to cut the thin plywood with a Stanley knife using a metre stainless steel rule to cut against. I am not a total idiot so I placed a thick leather glove on my left hand prior to cutting, just as well of from here on in I would be writing in my own blood!

I was able to finish cutting out the first shape with only damage to the gloves, thankfully. I then placed it inside the aluminium angle A-frame, drilled a couple of holes towards the apex of the A-frame through the angle and the plywood. I cut a couple of lengths of the 1mm aluminium strapping and placed that inside the plywood, drilling through it as well. I then place pop rivets in both holes to keep everything together. To cut out the second side I used my table saw, the Stanley knife works but the table saw is easier!

**Handles**

To move the tractor around comfortably I need to have handles on each end, so I had a look around and found a pack of 6 Raised Dee Handles (96mm) which would do the trick. I drilled holes through the mid-rail piece of angle on each end of the tractor, then lined up the handles and screwed in the attachment screws. The screws passed through the aluminium angle as well as the 4mm plywood before being screwed home into the handles themselves, that way the handle screw keeps everything together at the bottom of the plywood infill, and also holds the wired mesh folded over the mid-rail in place.

**Ridge Capping**

To prevent any rain getting in through the top of the tractor I made a ridge cap out of white colourbond mini-orb. When I made the previous tractor I got hold of a 2000mm x 900mm sheet and used a 400mm width cut from it. This time I decided I wanted more overlap so I used the 500mm remainder. I picked the middle corrugation then, holding it flat on the ground, bent it in the middle so that there was more or less 250mm on each side of the bend. By leaning heavily on it I was able to bend it down to an approximation of the angle on the top of the tractor A-frame.

**Long Side**

With the ends in place it was time to remove the plywood long side from the previous chook tractor for recycling. This was to fit the side which did not have any wire mesh on it. The plywood is marine ply so even after 5 years doing service on the old tractor it is still in good condition. To give it some more fixing points I measured and cut two more lengths of aluminium alloy and pop riveted them at where the top and bottom of where the long side would fit.

It was a simple matter to remove the screws from the old tractor, transfer the plywood sheet into place on the new one, then drill holes in the supporting angles, top bottom and the mid- line and re-screw it into place. With that done I could also drill and screw the ridge cap in place to the top of the long side.

**Roosts**

The previous tractor had two roosts made from broomsticks as well as a roosting/laying area in each end. In practice I never saw the chooks using the roosts, generally they would lay in one end and sleep (and crap) in the other. So this time I dispensed with the broomsticks and just built in the roosting area in each end. I did this by cutting some 16mm particle board with melamine on both sides and one edge so that it fitted between the two mid-rails. A screw put in through the mid-rail on both sides into the particleboard kept the roost secured and I attached some 70mm x 20mm pine on the outside edge of each roost to stop the straw lining being pushed out by the chooks.

As in the previous model, I drilled holes in the centre of each roosting area and installed a hook in each one so that I could hang up the feeder and waterer. I put them in the

centre of the roost for protection, too far out and the feed will get rained on, too far inside the tractor and both can get crapped on.

**The Door**

The door is horizontal and runs for the whole length of the tractor above the front meshed area. It is also made of 4mm thick marine ply which has been recycled from the previous model. I installed a piece of 70mm x 20mm pine inside the A-frame angle and screwed it to the frame to make sure the pine was secured. To make the panel openable I wanted to use a piece of 915mm long piano hinge screwed into the top of the door and into the pine bearer, but this would cause a problem. Due to the 4mm thickness of the plywood door sitting on the pine, the piano hinge could not be screwed down to both, so I cut some plywood of the end of the door and then screwed it into the pine bearer, this allowed me to fix the piano hinge onto the door and the support because they were both at the same level.

The old chook tractors did not just fall apart overnight. There is a slow degradation where bits break, fall apart and fall off such that I start to spend a lot of time on running repairs and have to be very careful when we move it, down to the point where

we get what is effectively a catastrophic failure and I need to build a new one by the time we need to move it next. I must admit, with a new tractor, that feeling of being able to move it without fear of it falling apart and letting the chooks out is wonderful, and I am basking in it at the moment!

Overall the new tractor is working well. It is considerably lighter than any of the previous models which makes it easier for Linda to help me to move it and it is considerably stronger. Also, the frame will not rot and collapse at some time in the future…….winner!

### 3.2.6 Chook Tractor 4.0 – Replacing the access

All good things must come to an end, and that includes the front access door of the chook tractor which I lift up to access the eggs and feed the chooks. This style of access door was installed on the second chook tractor design and since this is now the third chook tractor which this particular door has graced, it has been out in the weather for somewhere upwards of 15 years. I picked it up when I worked for a plywood manufacturer *mumble* years ago and it hung around for quite a while before it was pressed into service with the chooks.

To be fair, it has been on the downward spiral for some time also. It have already turned it round once so that the top edge originally hinged to the main body of the tractor became the bottom edge. That did extend the life of the access door for some years, but did not totally stave off the inevitable. Also, the way it was designed, the ever increasing gap between the access door and the top of the tractor meant that more and more rain could get in to the chooks living quarters. The rain bomb hit so it became time to act!

This time was a bit more drastic and, while lifting it up to access the egg area, a couple of hinges pulled out and a split developed down the middle. Lumps of plywood has also started to fall off and to prevent chooks escaping and laying waste our food production area. Also, the way it was designed, the ever-increasing gap between the access door and the top of the tractor meant that more and more rain could get in to the chooks living quarters. Then the rain bomb hit so it became time to act!

The original door was 1800mm x 500mm and in my quick wander around the big green hardware store (while studiously avoiding anyone unmasked at the time), the best I could find was two pieces 1200mm x 600mm. So I fired up the circular saw and cut 300mm of one end of each of the new doors. The hinges did have a nasty habit of being the first point of failure so I cut some 42mm x 19mm DAR pine and screwed it into the top of the doors where the hinges would be affixed.

It was then just a case of affixing two equal access doors side by side rather than one long one. Each door was affixed by two hinges and due to the fact that it was two shorter doors rather than one long one made the job easier. There were a couple of other advantages to this configuration as well –

• We tend to lift up one end or the other to access one side of the nest area and this puts strain on the other side, resulting in damage to the original door. With two new doors there is less weigh bearing on the hinges.

• Being able to access one end only means that if there is a chook in residence at the other, it can't just decide to break out and trash the place while we run around like idiots trying to catch it. (not that that ever happened, but just sayin')

• The new design with the strengthening of the hinged to end, also reduced the likelihood of rainwater getting in to the living area.

The doors need a paint but that will happen later, once the rain had passed.

**Update – a couple of years later!**

Of course things don't always work out the way we want them to, and I didn't get around to painting the new doors, but that shouldn't have made a difference because they are supposed to be marine ply, aren't they? After a couple of years of weathering, you can see from the photo below that they were not doing well!

I have had to get hold of some more plywood, but this time I made sure to give the doors three coats of gloss white paint *before* I put them on! Unfortunately, during the process of replacing the doors I found that the timber frame that I was affixing them to had rotted out as well and had to be replaced. The pic below shows what the chook tractor looks like now. The chooks (and I) are very happy with the result!

### 3.2.7 Moving the chook tractor

The whole idea behind a chook tractor is that it is mobile, so that the chooks can work their magic over a large area over time without getting out to have 'unauthorised' fun. We have 14 veggie patches and move the chook tractor every two weeks so that the tractor sees each bed twice per year.

Some people use wheels on their tractors but that doesn't work very well for our situation. If I had my time again, I would line the veggie patches up together so that the tractor could move from one patch to the next in rotation effortlessly. Due to the fact that our veggie patches evolved over many years before the tractor came along, our system is not like that.

What that means is the tractor needs to be moved lengthways, sideways and every which way around to get it into place. Also, due to its design, the way it faces will vary during the year, facing the sun in winter and vice versa in summer.

Another confounding factor is that quite often the chook tractor needs to be lifted while being moved to get it over the protruding tops of the ollas we use for irrigation in the veggie patches.

The upshot of all this was that I needed to install handholds of some description to allow the tractor to be carried to where it is needed.

The handholds varied a bit between the chook tractors that I have constructed over the years, (we are currently on 4th generation) and the photos below illustrate what I came up with. Unfortunately, they did not solve all problems.

*First Gen - vertical handles on the mesh end, horizontal handles (similar to other generations) on the coop end.*

*Second Gen - horizontal handles on each end*

*Third Gen - horizontal lifting bar on each end*

*4th Gen - horizontal handles on each end*

It still required a person on each end of the tractor and when my daughter and son-in-law were living with us that was not a problem, but when they moved out it meant that I needed someone else on the other end and that became a problem.

Linda is a tiny little thing and not up to carrying half the weight of the chook tractor, but after some consideration we came up with an idea that did work. I lift up one end and insert the nose plate of our hand trolley under it, Linda levers it back and I lift the other end and between the two of us we can move it around the yard to wherever it needs to go. If I am only shifting to the next bed along, I can usually lift it and move it across by myself.

But there has also been one other minor issue.

The beds along the western fence, which have Besser block borders, are 3 metres long (the chook tractor is 2 metres long) and the way I usually work it is to put the chook tractor on one end of the bed for a week, then move it a metre towards the fence so that the whole bed gets at least one week of chook. Unfortunately, moving the tractor towards the fence is not easy. I can drag it but I wind up between the tractor and the

fence so I cannot get it right to the fence resulting in part of the bed missing out. Pushing from the other end does not work either due to the friction of the tractor base with the Besser blocks. I worked a way around it by placing some timber on the Besser blocks between the tractor and the fence, lifting the forward end of the tractor onto them, I could then slide the tractor forward with very little effort.

Job done!

## 3.3 The Retirement Village and other things

**The Retirement Village**

There comes a time in each chooks life where they get a bit old and tired to do the work in the chook tractor, and they stop laying eggs! So the question that needs to be answered is – 'what are ya gonna do?' You could eat them, but the fact is that after a lifetime of service we don't. So we developed the retirement village.

The concept of the retirement village was developed some time after we implemented the chook tractor idea. I found a couple of well-ventilated aviary sheds that were redundant stock and were being sold off comparatively cheaply by the retailer I bought both with the idea that one would become our worm shed and the other the retirement village.

*The Chook Retirement Village (left hand shed)*

Both sheds are exactly the same. They are made of Colourbond steel of the ‘stand up and screw together’ type of construction 2.4 metres wide x 1.6 metres deep x 1. Metres high, with some panels being perforated with 10mm holes. The perforated panels are the left and right front panels (the right hand one of which is the door) and one panel on the left and right hand side of the front of the shed so that the left and right front corners are perforated. I installed the sheds on the northern boundary so that they would not take up valuable growing space.

I put down some 600mm x 600mm concrete pavers as the base and then constructed the sheds on top and after adding some hooks in the roof, tied up a feeder and a waterer and installed a diagonal perch so they could perch and see out through the perforations. I did find that the perforated wall which faced west let in too much of that western Sydney sun in summer, so covered it up on the inside with an old internal door we no longer needed.

The concrete floor is covered with straw (or locally grown grass hay when I can get it) which is sort of a deep litter system. This has a number of things going for it but the main one is chooks turn the straw over and consume any residual wheat grains and break the straw down a bit and I shovel out the straw and use it as mulch. The other advantage of this system is that there is no concentration of chook poop to deal with. It is mostly turned over and mixed with the straw, so it all gets shovelled out when I am applying the mulch.

They do occasionally provide eggs as well and I installed an old grass catcher in the corner of the shed for the chooks to lay in when they feel the need. This most often happens in early spring but we can get eggs at other times of the year. The retired chooks spend most of their time in the retirement village, but do get let out on occasion, generally in a wire pen to assist with bed clearing if required or to take advantage of fallen mulberries under our large mulberry tree in the front yard.

**Feeding**

Our backbone, go to feed for the chooks are free range layer pellets. I would like to grow and mix our own feed but it isn't practical for us. Having said that, we do produce all the green pick the chooks can eat, either self-harvested in the tractor or harvested by me for the retirement shed chooks. They could be leftover harvest of silver beet or more likely grabbing some edible 'weeds' growing around the yard, and yes we will partake of them too.

*We share our silver beet with the chooks!*

When the chooks were in their sedentary coop and run we used to also feed them scratch mix, which is a mix of seeds and grain which you can toss around and they pick what they want up off the ground. It made a nice end of the day to see them pecking around for their supper. Unfortunately I continued the tradition when they moved into the tractor/retirement village system, but stopped pretty quickly when the practice resulted in a world class weed infestation in each bed in turn as the tractor moved off it. We don't use scratch mix anymore!

*(L to R) chick crumbles, grower pellets, layer pellets. scratch mix*

They do get treats. These may be in the form of food scraps, peelings, stale bread or whatever, or pest caterpillars pulled of brassicas or other veggies. I don't think of such actions in terms of pest control, but rather harvesting chook treats! They also get

chilled fruit, like grapes or watermelon on the hot summer afternoons to try and make things more comfortable for them.

**Companionship**

One of the unexpected benefits of the chooks has been companionship while working in the back yard. Some years ago the family and I went to Belgium for Christmas to meet and spend some time with my son-in-law's parents, but I was going on frequent flier points so I left three days later. We were going for over a month so I had taken the chooks over to a friend's place to be looked after while we were away. I was amazed how 'dead' the backyard felt without the chooks being there, and the companionship they brought, just by their presence in the back yard!

**Conclusion**

Our journey with chooks has been interesting and certainly beneficial in all sorts of ways which I did not consider when we first got them. We have learned a lot too, sometimes through training (I did chooks as part of the Farm Tech certificate back in the late '80s), through reading and through just plain experience. I now have the happy opportunity of running chook workshops for local councils, so I get to share some of what we have learned. I have also had the pleasure of seeing friends who resisted getting chooks, finally getting them and finding out what a joy they are. So my advice to you if you are considering chooks is go for it! (but do some homework first!)

# 4.0 Making Chooks from Scratch

## 4.1 Incubating

OK, we are really talking about incubating fertile eggs to get replacement layers or perhaps (cue dramatic music) your own meat chooks so you need mummy chooks and daddy chooks or at least access to fertile eggs from someone else. In my case, one of the guys from our church has a rooster and so I was able to get some fertile eggs from him.

In the 'to do" list I noted that I was going to make an incubator and there are certainly designs on the net for DIY incubators but the problem that I had was getting hold of a sufficiently sensitive thermostat to hold the 37.6°C required to hatch chook eggs. The most commonly available ones are for reptiles and only go up to 30°C. Once you have the thermostat the rest is relatively simple unless you want to build in automatic turning, so I splashed out and bought a Hexabator (that actually is octagonal rather than hexagonal.....but anyway...). It is a simple unit with heating element, digital thermometer and fan that does the trick fairly well, it is also made of robust plastic rather than the more fragile polystyrene foam and the lid is clear so you can easily keep up with what the eggs are doing.

**Eggs for Hatching**

If you do have a set up that allows you access to fertile eggs make sure you get fresh ones ie less than seven days old, but realistically the fresher the better. My mate brought around two days production, about ten eggs then a day or two later another three so that all up I had 13 eggs.

*Our Incubator*

Make sure the eggs look normal, if they are odd sized, shaped or in any way dodgy looking such as having ridges in the shell or are cracked, don't use them for incubating. Also make sure they are clean direct from the nest, don't use dirty eggs for incubating. If there is a bit of dried material on the outside it can be wiped off with a dry cloth, cleaning dirty eggs with a wet cloth can spread bacteria and other disease causing organisms.

**Storing Fertile Eggs**

While they are waiting to be incubated should be stored between 15°C and 17°C and on a 35° angle and turned twice a day to get the greatest number of eggs hatched. This can be done by storing the eggs in an egg carton tipped to one side by placing one end on a lump of wood etc, then several times a day turning the carton around so that the opposite end is elevated.

**Incubating the Eggs**

Even if your incubator has a good thermostat you can't go past a digital thermometer to make sure that you are maintaining the required temperature of 37.5°C/ 37.6°C, as a temperature too low or high can cause all sorts of problems such as overly large or small chick, hatching to early or delayed hatching.

Humidity is also important so you should keep the water pans in your incubator full. The water evaporates remarkably quickly and early on had evaporated before I noticed, which may have contributed to our low hatch rate. Our incubator has neutral coloured bottom where the water channels are and there is not much contrast so seeing whether they are full of water can be difficult. When I do it again I think I would put a bit of food dye in the water to make this easier. In any case, check the water levels at least once every day.

Another thing that must be done is to turn the eggs three times (or any uneven number) per day, every day to stop the chick sticking to the egg membrane. If you have a machine that does this automatically, good for you! If not it can prove helpful to mark off when you have turned the eggs on a sheet of paper so can tell at a glance how many times the eggs have been turned that day. Needless to say this is an investment in time required for the entire incubation period (although you don't need to turn the eggs the first 2 days in the incubator) and we had a night out booked for months when we realised it fell in the middle of the incubation period and had to get our daughter and son-in-law to come over and turn them for us.

*The chooks are hatching!*

Where the eggs are on their side, as was the case with our incubator, they should be turned a full 180° and to facilitate this I wrote the date we received the eggs in pencil on one side of the egg. In that way it was just a case of rolling the eggs so that the date was up or the date was down, and it was immediately obvious if all eggs were correctly turned. I have also read of marking an "X" on one side and a "O" on the other, but in the end it is whatever works best for you.

It is possible to keep a check on the developing chick by shining a light up into the shell and seeing what size lump is in there, this is called candling. I must admit we did not do this; we just waited to see what we would get. The chicks should start coming out on day 21 and be all out on day 24 so it is important to note what day they go into the incubator. We got six chicks hatch out of the 13 eggs, but one had foot problems right from the start and only survived a couple of days so all up we got 5 chicks.

**After They Hatch**

We left them in the incubator for a little while to dry out once they had hatched and then transferred them to the brooder that we had made for previous batches of day-old chicks we had bought (see the article on how to make a brooder in the chook section of this site).

We have had chooks for many years but this is the first time we have hatched our own and it is a remarkable experience, so different to reproduction in mammals. If you have any interest at all in making your own chooks from scratch I highly recommend it, and I bet your kids would love it!

The results! (So cute!)

## 4.1 Making a chook brooder

I have kept chooks for many years, and for the past few years I have bought point of lay Rhode Island Reds from a local poultry farm to replace those that have gone to a better place. We have had some recent chookacides and we're down to one laying hen and one retiree, so replacements were due. Unfortunately, since the last set of

replacements, that local poultry farm had closed down. This left me in a bit of a bind and after spending one Saturday afternoon trying to track down a producer of chooks I thought “bugger it! I’ll raise my own!” As usual, decisions taken in haste mean lots of fun down the track.

We have a pet shop near us that keeps baby chicks as food for reptiles etc. so I figured that I could raise some of them up to laying size (and save them from being lizard poo). It has been almost 10 years since I brooded chooks (as part of the farm technology course) so I thought it was worth a try, but what on earth could I use as a brooder?

I remember reading somewhere (possibly on the internet) that someone had made a chook brooder out of one of those plastic boxes used to store clothes and other junk under beds or in wardrobes. So I went looking for one in the el cheapo shops that you find around nowadays (like the Warehouse etc.), to get the biggest one that I could find. This turned out to be 430mm high, by 450mm wide and 680mm long, which translates into roughly 120 litres. It was the last of the batch and had some bits off, so from an original price of $20, I talked them down to $16 (can I haggle or what!)When I got it home it looked huge, but as it turned out, bigger is better!

To prepare it for accommodation, I cut a large ventilation hole in the top 570mm long by 235mm wide, basically by cutting out a raised panel in the top. My initial thought was to do this with a Stanley knife, but this was tough plastic and after a couple of close calls on finger amputations and 20 minutes of sweating and swearing, I grabbed the jig saw! After drilling a hole big enough to accept the blade, it took just a matter of minutes to complete the hole and remove the panel. I then covered the hole with fly screen to screen out flies, cats and other annoying insects, supporting the wire by screwing some battens made of 20mm scrap plywood cut 35mm wide and long enough to bridge the gap.

The next trick was to provide some heat so the little things wouldn't freeze to death as well as light for those all night chook parties. To achieve this I wired in a light using a recycled batten fitting and some old 3 core flex and plug so that the light was 250mm off the floor of the brooder. My original intention was to use a 40 watt bulb so as not to overheat the chicks but all we had was a 60 watt so I used that, but when we first got them they clustered below it so in the end I had to upgrade to a 75 watt anyway. I have since seen a design where the lighbulb is encased in a terracotta plant pot so that while it keeps the space heated it does not subject the poor little chickees to a continuous 3rd degree (besides, I know where they were on the night of May the 5th). When it comes time to use the brooder again, I will be fitting a pot over the bulb!

Once the structural work was done, I used a couple of ceramic ramekins to hold the feed and a commercial plastic waterer (OK, I wussed out and bought one, but it was 20% off on the 'specials' table!), then put newspaper and pine wood shavings in the bottom. The newspaper/shavings absorb their droppings and give them firm footing, the plastic being very slippery.

**Now it was time for the chooks!**

Unfortunately, on closer enquiry, the day old chicks for sale at the pet shop were a meat breed……bugger! This then caused a wasted weekend while I raced hither and yon looking for day old Rhode Island Red chicks, but all to no avail. After a quick search on the internet, I found out that the chook producer had relocated, not closed down.

DOH! However, I had gone this far so to save money and for the interest we picked up two day old Rhode Island Reds and two day old Australorps.

They were so tiny looking in that huge brooder, I thought that I could have made do with a smaller one, but boy, do they grow! According to the books, they need supplementary heat for the first five weeks, and they actually stayed in the brooder for six weeks, but by the end of that time I could actually hear them hatching plots to break out and they were getting pretty cramped.

While they were in the brooder, they were fed on commercial chick crumbles and I threw in some coarse sand when I changed their bedding, so that they could peck it and get into their crops to help grind up the food.

The chicks were raised during July and August in Sydney so the extra heat was needed to keep them warm even though they were in the lounge room for most of the time. The chicks are very cute but somewhat noisy. My son in law found that out one night when he was a bit crook and spent some time on the lounge. Towards the end of their time inside, they needed their litter changed every few days and my wife was mumbling dark threats about what would happen if they didn't go outside soon.

At 6 weeks the chook tractor was finished and I could move them outside safely!

## 5.0 Making a simple chook feeder

When setting up your backyard chook run it is possible to spend lots of cash but, as you know, on this site we like to focus on the low cost DIY approach and this philosophy finds its expression in the form of a low cost, low tech chook feeder. This is not my idea, it is my take on an idea I found while tooling around on the net. I hope you find it of some use.

This feeder and its larger flock variant are cheap to build, even if you use all brand new components you should get out of it for less than $10. It is constructed of 90mm storm water piping and fittings and can be thrown together with a minimum of hand/power tools most of which you probably have hanging around anyway. You will need –

**Small feeder**

- 1 x 1 to 1.5 metres of 90mm diameter PVC piping
- 1 x 90° elbow to fit 90mm diameter PVC Piping
- 2 x end caps to fit 90mm diameter PVC Piping

**Large feeder**

- 1 x 2 to 2.5 metres of 90mm diameter PVC piping
- 1 x Tee fitting to fit 90mm diameter PVC Piping
- 3 x end caps to fit 90mm diameter PVC Piping

*The Parts*

**Tools**

- 1 x electric drill (you could use hand powered one but it would take much longer)
- 1 x 3mm or 4mm twist drill (drill bit)
- 1 x 54mm (or thereabouts) hole saw
- 1 x tenon saw
- 1 x 300mm straight edge or ruler and/or tape measure
- A pencil or other marker
- Some sand paper

## 5.1 Making the Small Feeder

Cut the 500mm of the PVC pipe with the tenon saw and make two pencil marks 100mm in from each end.

Measure in half the diameter of the hole saw (in my case this was 27mm) and make another mark, then drill a pilot hole with the 3 or 4 mm drill bit to prevent the hole saw from wandering.

Place the drill part of the hole saw in the pilot hole and drill out a 54mm hole at each end of the pipe so that the outboard edge of each hole is 100mm away from the end of the pipe.

Pilot holes drilled and hole saw used

Using the straight edge, draw a line from the outside edge of one hole to the other, then repeat on the other side so that you have two lines along the length of the pipe with a 54mm hole at each end. Secure the pipe by having someone hold it or by lightly clamping it in a vice and use the tenon saw to cut down the two horizontal lines so that the pipe now has a 54mm wide slot, rounded at each end. This is the bit the chooks will eat from. It is a good idea to get hold of some sandpaper and take off any sharp edges around the cut to prevent any nasty surprises for the chooks.

The first cut is made

The whole thing can now be assembled by placing a pipe

into each end of the 90° elbow and securing either by glue or screws, and then placing the end caps on the open ends of the pipes. The end caps should be secured with a screw (drill a hole the size of the shank first) because the top one will need to be removed to add more feed and the bottom one will need to be removable for cleaning.

Wire the whole assembly onto the side of your chook pen and away you go! The chooks give it their seal of approval

## 5.2 Making the Large Feeder

Follow the directions for the minimum feeder up to where you have cut the slot in the bottom pipe then take a second 500mm length of pipe and cut a slot in it using the same method as the first one.

Now, rather than attaching the 90° elbow, to the pipe that is to be the upright, attach the tee section at the bottom of the vertical pipe, and then insert the two sections of pipe with the lots in the two horizontal holes, secure with glue or screws and attach the end caps to each open end of the pipe and secure with a screw.
This one has two “pecking pipes” rather than the one of the simple feeder so you will want to have a longer vertical pipe to provide more feed. Unfortunately the feed does not appear to flow as freely into the pecking pipes from the vertical pipes so initially it might be an idea to keep an eye on it to make sure all is well.

*The Finished Article*

## 5.3 Making a High Capacity Chook Feeder and Waterer

A number of friends of ours have expressed a reluctance to keep chooks, mainly due to the commitment required, or at least their perception of the commitment. Chooks really do not need any more care and attention than a cat or dog and in some cases they need less. To make things easier, it is possible to set things up so they can make use of feeders and waters that provide the necessities of life over a longer time. The bonus is that they can be made at home quite cheaply.

Obviously whatever happens you need to keep an eye on your chooks but if you do go away for a few days there is no need to fret, and you can get a friend or neighbour to keep an eye on them. With the burden of providing food and water removed, you are more likely to get volunteers.

The feeder and waterer described below were put together by a friend of mine and have been in service for over 6 months.

### 5.3.1 Feeder

Making the feeder is easy, and recycled materials can be used with the addition of one bought fitting, although who knows, you may be able to find one second hand. The container can be almost anything which has a lid, in the case of my friend used a couple of small (20 litre or so) 'wheelie bins'. They work well because they are light, have good capacity, are easy to move about and have a weatherproof lid.

To turn the bin into a feeder he cut a 95mm diameter hole in the side of the bin near the bottom. This could be done by drilling a series of holes around the perimeter, punching out the centre then using a file to smooth off the edges or by cutting the hole out with a jig saw. Once the hole was cut, he fitted in a *90mmf x 90$^{o}$ bend flanged tank overflow outlet* into it with the bend facing down and using self-tapping screws through the flange into the bin to secure it. Job done!

When the bin is filled with pellets or grain the chooks feed out of it and more drops through from above keep the feeding area stocked as they consume it.

A 90mmf x 90$^{o}$ bend flanged tank overflow outlet - side view

Note: the 90mmf x 90$^{o}$ bend flanged tank overflow outlet is available from hardware stores for under $5 (2014 prices)

### 5.3.2 The waterer

This one is almost as simple. A fitting is needed which can be obtained cheaply (a dollar or two each) on the internet and is called a *poultry watering nipple*, they generally come in red or yellow and I have been told the red ones are the best but the yellow ones seem to work OK too.

Inside the plastic sleeve is a stainless steel grommet through which a piece of steel which looks like a nail with a conical head passes followed by a small stainless steel weight. The chook pushes up on the 'nail' with her beak which unseats the conical bit and allows water to flow into the chooks beak.

The container, again, can be just about anything that will hold water. My friend used some 20litre water cooler bottles, these can be picked up second hand quite cheaply from recycling centres such as **Reverse Garbage**, but anything which holds water and you can drill through will work.

The nipples must be vertical to work so you have to drill in the bottom of the container. An 11/32" diameter drill works for the yellow ones. Drill the hole and gently screw in the nipple, don't get too aggressive or you will strip the thread and it will leak. In any case, put a thin bead of silicon around where the nipple enters the container to prevent leakage.

Poultry Nipple Waterer assembled (above) and exploded (below)

Once the nipple is secured fill the container with water and check for leaks. You might need to pump the 'nail' up and down while the chooks are around so they will work out this is where to get the water from. An advantage for this type of waterer (apart from volume and cheapness) is that the water source is enclosed so it won't get contaminated by the dust and crap that the chooks will scratch up as part of their daily activities. The water going in must be clean, any particulate matter may cause the nipple to leak so keep an eye on them. Having a couple of waterers is probably not a bad idea, they are cheap enough to put together.

So now that your last objection to owning chooks has been laid to rest, get chooking!

## 6.0 Egg Eating in Chooks

One of the most annoying habits that a chook can acquire is to start eating their own eggs; it brings your main product down to zero, means you are feeding them for nothing and it gets old really quickly when you have to rush out to the chook pen when they make egg-noises to find nothing there, or worse a wet spot on the bedding. Plus once one chook starts the others pick up the habit really quickly and once in place the habit can be hard to break. It is a pain in the bum big time, but with a bit of knowledge and understanding it is possible to work a way around it without getting an axe involved.

There are a number of circumstances that can start off egg eating –

- Lack of calcium – this should not be a problem if you are feeding commercial rations but if you are making your own rations make sure to include plenty of shell grit. It is OK to feed chooks egg shells so long as they are not recognisable as eggs, so grind them up to a fine powder before adding to the chooks rations.
- Boredom – whoever said that the devil makes work for idle hands (or in this case, beaks) wasn't thinking about chooks when they said it, but the idea still holds. Bored animals can get up to all sorts of unwanted behaviours so some form of activity is good.
- Overcrowding – we found this to be a problem when we put the three new chooks in with the three existing chooks into the chook tractor. Too many chooks in a small area, I believe caused our outbreak of egg eating and it did not stop when we dropped from six chooks back to four in the tractor.
- Broken eggs – if the laying area is lacking in soft material then eggs can get broken when chooks are moving around on the nest and, being inquisitive creatures the chooks will investigate this new phenomenon and discover a highly undesirable culinary treat.

If you do suspect that egg eating is happening it may be shown by an unexplained drop in egg production and/or investigation of chooks making egg noises and finding nothing there or finding broken/half eaten eggs or the above-mentioned wet spot.

So the next question is, what can you do about it? Fortunately, lots of things but if you do think you may have an outbreak of egg eating it is important to act quickly, before other chooks can pick up the habit and before the miscreant can cement the habit in their chooky brain. To start with –

1. Make sure that the nesting area is full of lots of soft fluffy material to reduce the likelihood of accidental breakage, and
2. Check for eggs three or four times a day if you can, so the freshly laid eggs are not lying around in the pen and presenting a temptation to bored or hungry chooks. We tried for a while to run out every time we heard a chook making egg noises, but after a while I'm sure they did it just to watch us run out, and then giggle behind our backs as we went back into the house empty handed.

If the outbreak is confirmed and has gone past the early stages, there are still a number of actions that you can take –

1. Make a hand grenade egg - Get hold of a whole egg, make a small hole in each end and blow out the contents (which are then available for use) and fill the egg with chilli sauce, Tabasco sauce or any other hot sauce you have and place it in the nest. The miscreant chook will take it for a fresh egg and proceed to enjoy it, thus getting a beak full of the hot stuff and be put off doing it again. This may require to be done a number of times. At the same time -
2. Get hold of some artificial eggs, back when I was a young fella you used to be able to get plastic eggs with sand in them that you could use to show the chooks where to lay, you can still get plastic eggs for decorative purposes and these will work too. Place several in the laying area and they will try and eat them, to no avail and then hopefully get out of the habit. I have even heard that golf balls will fulfil the same function, but we used plastic eggs and they worked well.

## 7.0 Resources

**Chickens in Your Back Yard** – Rick and Gail Luttmann – Rodale Press Inc (US) 1976 ISBN 0 87857 125 6 – A good basic book that covers the subject well, if from a US perspective. The book talks about protecting your chooks from predators, accommodation using the coop and run system, feeding the flock including mixing your own feed, when and how much, and roosters. Also covered are chooks for eggs, including hatching your own, and care and feeding of chicks; chooks for showing and chooks for meat as well as chook issues and their solutions and starting your flock. The book has quite a number of line drawings.

**Keeping Poultry** – Dept of Agriculture, Tasmania – Dept of Agriculture, Tasmania (AUS) 1989 ISBN 0 7246 1663 2 – A good basic book from an AUS perspective but not particularly skewed towards the small producer and definitely not organic/free range. The book covers breeds and breeding, housing a small flock, the various parts of chook anatomy and how they work. Also covered is stock replacement programs, laying bird management, night lighting, feeding hatching eggs, keeping the chooks healthy including external parasites. The book contains mainly line drawings, a few black and white photos and one glorious colour photo of what a chook looks like inside! (if you are squeamish, look away!)

**Backyard Poultry, Naturally** – Alanna Moore – Python Press (AUS) 2004 ISBN 0 9585590 1 5 – OK, this is one of my FAVOURITE chook keeping books. Lots of good info for the backyard producer, it's Aussie, it covers most if not all of the stuff you need to start up your own flock and is written from an organic/ Permaculture perspective and covers ducks as well as chooks. The book covers why you should keep poultry, behaviour and management, breeds, housing, feeding back yard poultry including mixing your own and chook breeding. In the health section she does advocate homeopathic remedies which have no scientific basis. There is a small section on poultry and permaculture and a section on weeds that can be fed to chooks, and backyard poultry produce and what

you can do with it. The book has mostly black and white photos with a colour section on some of the various breeds.

**Chicken Tractor** – Andy Lee and Patricia Foreman – Good Earth Publications (US) 2000 ISBN 0 9624648 6 4 – While not particularly designed towards the backyard market, it contains lots of good information of various styles of chook tractor and how they are used. Definitely organic/ Permaculture base. Chapter one covers what a chook tractor is, and chapter two, why you need one. Chapter covers the various types of chook tractor systems and how they are used, including the Polyface Farm model. Chapter four covers making strawbale chook house. Chapter five covers soil building with a chook tractor and why they are better than rotary hoeing, chapter six is a short section on keeping chooks in the tractor including light, health, roosts and perches. Chapter seven covers marketing and making money from your produce and chapter eight covers DIY chook tractors. Later chapters cover chook processing, selecting chooks for your tractor, raising chicks, predators, feeding chooks including organics and chook health and disease. The book has a number of line drawings.

**A Guide to Keeping Poultry in Australia** – Dorothy Reading – Thomas Nelson Australia (AUS) 1983 ISBN 0 17 005788 7 - A good basic book that was, for years, the only Aussie book in my chook library and primarily covers chooks. The book covers the domestic chook anatomy, breeds and which ones to buy followed by housing, feeding, breeding, flock care and management, problems with chook health and parasites etc and dealing with their produce. The last four chapters provide general information, breeds and management etc for ducks, geese, turkeys and 'other poultry' ie guinea fowl, pheasants and quail. The book has some line drawings and black and white photos.

**Keeping Poultry and Rabbits on Scraps** – Claude Goodchild and Alan Thompson – Penguin Books (UK) 2008 ISBN 978 0 141 03862 9 –This is a facsimile edition of a book originally published in 1941, during the war. While obviously an old book it still has some good ideas for keeping chooks and rabbits in the suburban back yard. It is small paper back covering chooks, ducks and geese as well as rabbits so the amount of data in each subject is limited. Interesting bits are - a stored heat cooker for mash (Mash is rare

in Aus these days), a list of interesting veg to grow to feed your chooks, a good variety of static and mobile houses, making a 'sitting box', and symptoms of poisoning and what the likely cause is. Quite a few line drawings for the size of the book and a centre section of black and white photos of poultry breeds.

**Chicken and Egg** – Andy Cawthray & James Hermes – Ivy Press (UK) 2015 ISBN 978 1 78240 200 8 – The book is divided into 3 parts. The first part is introductory and talks about that chooks are and a bit of their history, the science of egg formation, internal and external aspects to egg quality and feeding chooks for egg quality including organic ingredients. Part two is a review of 15 egg laying breeds including origins, features, temperament, care, their eggs and including a colour photo of the hen and rooster for each breed, The third part covers keeping chooks for eggs and talks about getting started, the top 10 reasons for keeping chooks and what might go wrong, choosing your hen house and run, putting your flock together, laying and brooding, diet and health. The book has a few diagrams and lots of colour photos.

**Chicken DIY** – Daniel Johnson & Samantha Johnson – Fox Chapel Publishing (US) 2017 ISBN 978 1 62008 230 0 – This book starts out with introductory sections on why bother with DIY, tools and skills required and a look at the history of chook keeping. The rest of the book provides details for twenty, chook related DIY projects. The details for each project includes an introductory discussion, a materials list give the timber etc, parts required and tools needed followed by a step-by-step how to including a photograph of each step. Projects include a chook tractor, quarantine habitat, collapsible chook run, various nest boxes, feeder & waterer, incubator, roost, dropping board, brooder wading pool and lots more. The book has lots of colour photos.

**The Chicken Whisperer's Guide to Zero-Waste Chicken Keeping** – Andy D. Schneider & Dr Brigid McCrea – Quarto Publishing Group (US) 2019 ISBN 978 1 63159 734 - This book is divided into six parts. The first part 'A Year with Hens and No Waste' talks about planning the flock and issues to be considered during the year including biosecurity, rearing chooks, feeding, watering etc. The second part covers feeding in detail, including feeding through the various life stages, planning and implementing various

low waste feeding strategies. The third part covers composting chicken waste, the fourth part covers gardening with chooks including locating the garden, soil preparation and what to do at the end of the gardening year. The fifth part covers housing chooks including brooding, coops that will last, options for fencing and feeding and watering. The six part covers what to do when the hens stop laying ie butchering, cooking and eating.

**Chook Wisdom** – Alan T. Gray (Ed.) – Earth Garden (AUS) 2007 ISBN 978 0 9578947 0 8 – These three books are composed of a series of articles submitted and published by Earth Garden magazine about chooks and chook related issues. This one has a total of 45 articles in four chapters – Chapter 1 build before you buy or breed (8 articles); Chapter 2 Growing the good egg (2 articles) Chapter 3 Living the chook life (20 articles) and Chapter 4 Health and wellbeing (15 articles). This book has lots and lots of colour photos.

**More Chook Wisdom** - Alan T. Gray (Ed.) – Earth Garden (AUS) 2011 ISBN 978 0 980 8487 1 7 – As a continuation of the previous part of the series with a foreword by Jackie French. Chapter 1 is Living the chook life (15 Articles); Chapter 2 Build before you buy or breed (3 articles); Chapter 3 is Growing the good egg (3 Articles) and Chapter 4 Health and Wellbeing (11 articles) giving a total of 32 articles.

**Even More Chook Wisdom** - Alan T. Gray (Ed.) – Earth Garden (AUS) 2012 ISBN 978 09808487 7 9 – This is the final book in this series. Chapter 1 Living the Chook life (8 Articles); Chapter 2 Build before you buy or breed (6 articles); Chapter 3 Growing the good egg (5 articles) and Chapter 4 Health and wellbeing (7 Articles) giving a total of 26 articles.

**Jackie French's Chook Book** – Jackie French – Manna Press (AUS) 2010 ISBN 978 0 94721 459 3 – Completely revised and updated. This is no longer a basic little book, it now covers why everyone should keep chooks and a year's guide to chook economics, choosing and breeding chooks including breeds, where to get them and how to transport them, keeping chooks including food, keeping systems and other chook

needs, chook safety and health problems, chookie extras ie using chook products, eating chooks and eating eggs. This is now a much more well-rounded and comprehensive reference, all told with Jackie's unique style.

**Free-Range Chicken Gardens** – Jessi Bloom – Timber Press (US) 2012 ISBN 978 1 60469 237 2 – This is a rare book, one that gives you options on keeping your chooks free-ranging but having a garden too! It talks about chickens and your garden, sustainability and lifestyle, practical considerations like the benefits of free ranging, and keeping both plants and chooks safe. The book gives you information around designing your garden plan, infrastructure and choosing the right plants as well as hard- and soft-scaping materials for landscaping. It also covers suggestions for plants of various sorts and different types of chook housing as well as pests and predators of chooks. Lots of colour photos.

**Backyard Chickens: Guide to Coops and Tractors** – David Thiel (Ed.) – Betterway Home Books (US) 2011 ISBN 978 1 4403 1696 8 – There is a short and VERY basic section on chicken raising but this is followed by a much longer section (covering the greater part of the book) on construction techniques. This section also provides plans and construction details for 13 stationary chicken houses and 3 tractors. There are line drawing plans for each type of accommodation as well as lots of colour photos showing the stages of construction. There is a resources page at the back, but this is only applicable to the US.

**Reinventing the Chicken Coop** – Kevin McElroy & Matthew Wolpe – Storey Publishing (US) 2012 ISBN 978 1 60342 980 1 – There is a small section at the front of the book covering the essentials which need to be in every chook house and the basics covering mesh, roofing, construction materials, locks and latches as well as some construction techniques. Each design provides a comprehensive materials list and step by step construction instructions including both line drawings and colour photographs. Most of the designs are simple and easy to build and include both stationary coops and tractors.

**Backgarden Chickens and other Poultry** – John and Cara Harrison – Constable & Robinson Ltd (UK) 2011 ISBN 978 0 7160 2268 8 – This is a basic book, covering all the usual suspects: preparing for poultry, housing, runs and equipment, choosing your poultry, introducing new birds, caring for poultry, feeding and watering, breeding. There are also a few pages on specific issues with each non-chook type of poultry – ducks, turkeys, geese & quail. There are a few line drawings, and the centre of the book has 8 colour plates.

**The Contented Chook** – Gardening Australia Magazine –Harper Collins (AUS) 2012 ISBN 978 0 7333 3053 7 – The book is in 3 parts: part 1 - Keeping Chooks covers the basics, setting up a hen house, materials, flooring, ventilation, food, vermin proofing etc choosing your chook which provides 1 page of information plus a photo for 24 breeds of chook. Part 2 – Chook Places covers over 60 chook houses and runs people have built with a page or two and lots of colour photos on each, but no construction details. Part 3 – Practically Speaking covers naming your chooks and the hen house and then gives step-by-step instructions on how to build a chook shed and a chook tractor. A few line drawings and lots of colour photos.

**The Chicken Health Handbook** – Gail Damerow – Storey Publishing (US) 1994 ISBN 978 0 88266 611 2 – This is the most comprehensive book on chook health and disease that I have seen. The book covers health and nutrition, the anatomy of a chook, external parasites, internal parasites, infectious diseases and environment-related problems in considerable detail. It also provides a series of diagnostic guides to help you determine what your chook has based on a description of symptoms. It even provides details on how to do your own post-mortem (just to check if your diagnosis was right!). The book discusses enhancing your chooks immunity, incubation and brooding as well as providing a series of detailed monographs on common chook diseases to assist in diagnosis. There are a few line drawings and black and white photos (including on the post-mortem stuff!)

**Backyard Chickens: Beyond the Basics** – Pam Freeman – Voyageur Press (US) 2017 ISBN 978 0 7603 5200 7 – This is not your basic chook book! Chapter 1 covers expanding your flock including hand raising chicks, using a broody hen and adding older chooks. Chapter 2 covers flock behaviour like the pecking order and how to integrate old and new chooks as well as working with your flock, chapter 3 is on life with a rooster including dealing with spurs, chapter 4 is all about eggs and chapter 5 is about health of your flock. Chapter 6 covers predators and chapter 7 covers feeding including how chooks eat and digest and feeding with kitchen scraps. Chapter 8 is chook keeping through the (North American) seasons and chapter 9 gives the low down on designing and cleaning your coop. The last few pages in Chapter 9 is a wonderful section on preparing for emergencies. Lots of colour photos.

**Storey's Guide to Raising Poultry** – Leonard S. Mercia – Storey Publishing (US) 2001 ISBN 978 1 58017 263 6 – This book is part of a series by Storey on raising various farm animals, so it is designed around larger scale than back yard, but has lots of good info. It covers all the basics such why raise poultry, housing and equipment, poultry biology, starting and managing a laying flock, brooding and rearing. It also covers the production of fertile eggs and producing meat chickens. Producing turkeys, waterfowl and game birds each get a chapter, with the final two chapters being on home processing of eggs and poultry and flock health. The book has lots of line drawings.

**Storey's Illustrated Guide to Poultry Breed** – Carol Ekarius – Storey Publishing (US) 2007 ISBN 978 1 58017 667 5 – This book is pretty much what it says on the tin. Chapter 1 gives a short introduction on natural history, genetics and species, breeds and varieties. The second chapter (first over half of the book) is chook breeds, laying, meat and ornamental, chapter 3 is waterfowl – ducks and geese, chapter 4 is turkeys and chapter 5 is the "also rans" including emus, ostriches, peafowl, pigeons, quail and swans. There is a h=short monograph on each breed, including a description and a colour photo usually of the cock and the hen.