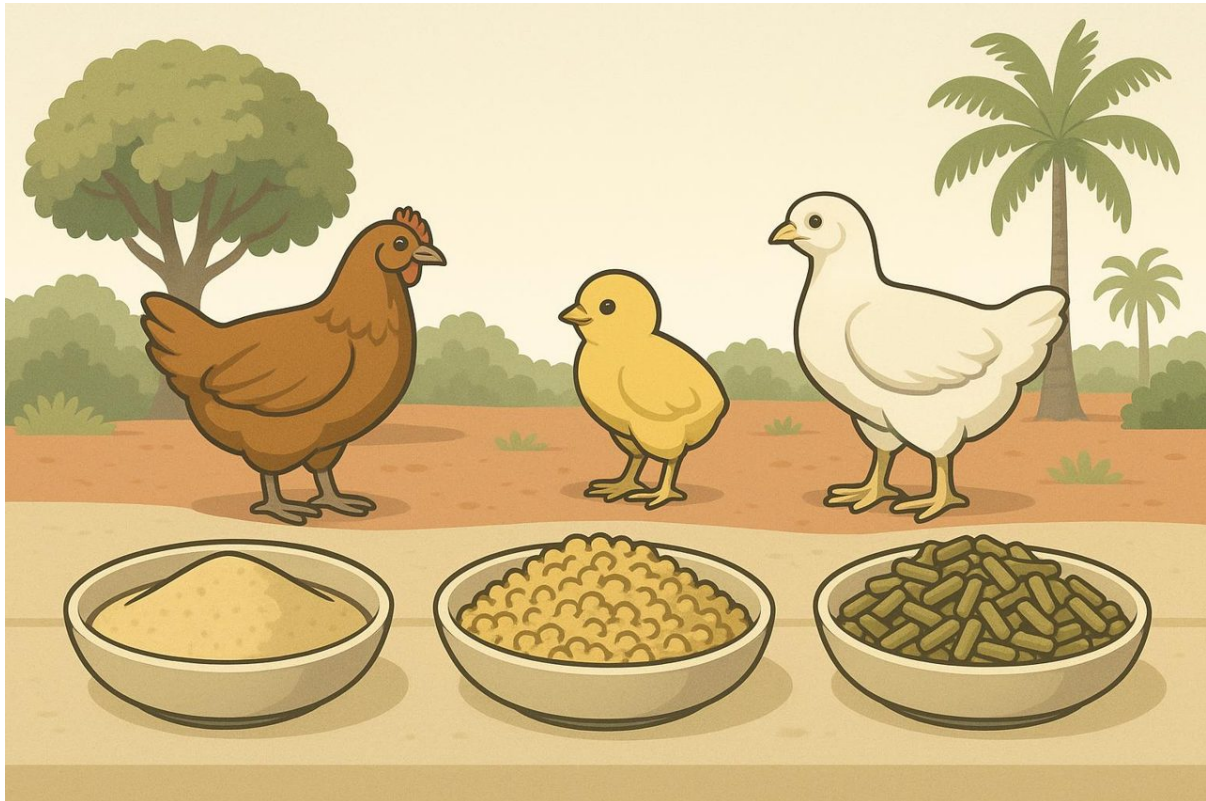


Poultry feed and water guide

The right feed at the right age, stored properly, and clean, cool water at all times

Benchmarks: Cobb 500, Efficiency Plus (Hubbard), Hubbard Premium, Novogen Brown



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1. Feed phases

Feed is the biggest cost of the flock and the first lever for results. A bird's needs change with age: the young chick needs a protein-rich feed to build its gut, skeleton and muscles; later it needs more energy and less protein. That is why several feeds are given one after another, one per phase.

White broilers

Phase	Age	Form	Purpose
Starter	0 to 10-14 days	Fine crumbles	Build the gut and skeleton; protein-rich feed
Grower	15 to 28 days	Small pellets or coarse crumbles	Develop muscle
Finisher	29 days to sale	Pellets	Finish the weight: more energy, less protein

Coloured chickens and hybrids, which are kept longer, follow the same three phases, but longer ones: starter until about 3 weeks, grower until 8 to 10 weeks, then finisher. Follow the changeover ages advised by your feed manufacturer for your type of chicken and your selling age.

Brown laying hens

Phase	Age	Purpose
Pullet starter	0 to 6 weeks	A good start, building the skeleton
Grower (pullet)	6 to 12-14 weeks	Produce a pullet at the right weight and uniform
Pre-lay (developer)	14 to 18 weeks, until the first eggs	Prepare the hen's body for laying
Layer	From the first eggs (around 19 to 20 weeks)	Produce eggs; calcium-rich feed for the shell

Tip: Each feed is made for an age. A finisher feed given to chicks deprives them of the protein they need. A layer feed given too early damages the pullet's kidneys with its calcium; given too late, it leads to fragile shells.

A bird's needs do not change all at once on a given date: they decline little by little. The more different feeds you give, the more closely you follow its needs; in practice, three feeds for broilers and four for layers are a good compromise.

2. Mash, crumbles or pellets

The same feed can be presented in several ways. Feed form matters as much as composition: a good feed in the wrong form gets sorted, wasted or poorly eaten.

The three feed forms

Form	What it is	For whom	Points to watch
Mash	Raw materials ground and mixed	Common for pullets and laying hens	Birds pick out the large pieces and leave the powder; more dust and waste
Crumbles	Pellets broken into small pieces	Starter for all chicks	Every crumble contains the whole feed: the chick cannot pick and choose
Pellets	Feed pressed into small cylinders	Broiler grower and finisher	Eaten quickly, little waste; a lot of powder at the bottom of the bag = poor-quality pellets

- Processed feeds (crumbles, pellets) are easier to handle than mash.
- They give better growth and a better feed conversion ratio than mash.
- At the start, feed should be a good-quality crumble.

Source: Cobb (Broiler Management Guide)

Tip: With mash feed, let the feeders empty once a day, around midday: the birds then eat the fine powder, which often holds the minerals and vitamins, instead of choosing only the large pieces.

3. Raw materials and what they do

A complete feed supplies five things: water (which the bird drinks), energy, protein (in fact amino acids, the "building blocks" of muscle and feathers), minerals and vitamins. These must all be present together and in the right balance: if one is missing, the others are poorly used.

What supplies what

Need	Purpose	Common raw materials
Energy	Keep the bird alive and make it grow	Maize (the basis of most feeds), sorghum, cereal brans and by-products, oils
Protein	Build muscle, feathers and eggs	Soybean meal (the most widely used), other oilseed meals, fishmeal
Major minerals	Bones, eggshell, body balance	Limestone and shells (calcium), phosphates (phosphorus), salt (sodium and chlorine)
Trace minerals	Needed in very small amounts	Iron, iodine, copper, manganese, zinc, selenium, supplied by the premix
Vitamins	Growth, immunity, strong legs, laying	Vitamins A, D, E, K and B-group vitamins, supplied by the premix

Source: Cobb (Broiler Management Guide)

The premix is a concentrated blend of vitamins, trace minerals and sometimes amino acids, added in small amounts. It is small in volume but essential: without it, even a feed rich in maize and soya produces birds that grow poorly, have leg problems or lay badly. Laying hens also receive a lot of calcium, which the eggshell needs.

If you make your own feed on the farm

- Use a formula drawn up by a nutritionist for the age and type of bird; do not copy your neighbour's formula.
- Weigh every raw material: never "by the bucket" or "by eye".
- Mix for long enough to spread the premix and minerals throughout: a few grams poorly mixed give deficient birds next to birds that get too much.
- Never replace one raw material with another without reworking the formula.
- Use only dry, clean raw materials, free of mould and insects.
- Never feed maize on its own: it lacks protein, minerals and vitamins. Cracked maize can supplement the finisher feed of coloured chickens, never at the starter stage.

Making feed is a trade that requires checked raw materials, an accurate formula and consistent mixing. NEXTEKCI holds the official approval for poultry feed manufacturing.

4. Feed quality and storage

A good feed can turn bad in a bad store. The heat and humidity of Côte d'Ivoire, especially in the rainy season, make feed lose its vitamins and encourage mould. Some moulds produce poisons, mycotoxins (including aflatoxins, common in maize that has been poorly dried or stored): they damage the liver, slow growth, weaken the birds' defences and can kill.



Good storage: bags on pallets, away from the walls, in the shade, dry, oldest bags at the front. — NEXTEKCI illustration

The feed store

- A room separate from the bird house, closed, dry, ventilated, sheltered from rain.
- Bags on pallets or planks, about 20 cm from the floor and the walls, so that air circulates and damp does not rise.
- First in, first out: write the date of receipt on each bag and use the oldest first.
- Beyond 4 to 6 weeks of storage, especially in the rainy season, feed loses its vitamins and mould takes over: do not buy too far ahead.
- Rats and mice: traps and baits around the store, no open bags, floor swept every day, spilt feed cleaned up straight away.
- A safety stock of about one week: a cut-off road or a late delivery must not starve the flock.

If you use feed bins

- Capacity of about 5 days' consumption.
- Bins must be completely watertight: the slightest leak makes the feed go mouldy.
- Two bins per house make it possible to change feed quickly when needed.
- Bins emptied and cleaned between flocks.

Source: Cobb (Broiler Management Guide)

Checking each delivery

1. Check that the label matches the order: type of feed, phase, date of manufacture.
2. Check the bags: intact, dry, no signs of water, rats or insects.
3. Open a bag: normal smell, usual colour, no lumps, not warm, little powder in a pelleted feed.
4. Take a sample from several bags (5 sub-samples mixed together) rather than a handful from the feeder.
5. Keep it cool, in a closed bag, labelled with the date, type of feed and delivery note number, until the flock is sold.

Source: Cobb (Broiler Management Guide)

Tip: A bag that is mouldy, warm, smells musty or has lumps is never fed, not even "a little" and not even mixed with a good bag: toxins do not go away in the sun or through a sieve. Put it aside and have the supplier take it back. Note that feed can contain toxins without any visible mould; the sample you kept means it can be analysed if the flock has a problem.

5. Feeding properly

A good feed is useless if it is not available to every bird, at all times. If feeder space is short, growth slows and the flock becomes uneven: the strong eat, the weak wait.



Chick feeder: placed on the litter, within reach of every chick.

How much feeder space

Type of feeder	Guideline
Brooding (paper or trays)	1 tray per 50 chicks; 50 to 65 g of feed per chick on the paper, topped up 3 times a day, for 7 to 10 days
Hanging manual feeders (hoppers)	1 per 40 to 50 birds
Automatic pans (33 cm diameter)	60 to 70 birds per pan
Automatic chain feeder	At least 2.5 cm per bird, counting both sides

Source: Cobb (Broiler Management Guide)

Good habits

- Feeder lip at the height of the birds' backs, raised every week as they grow.
- Feeders never empty, but never filled to the brim: above one third, birds scratch and flick feed out, and waste can reach 5 to 10% of the feed.
- During brooding, feed must never run out on the paper or trays, and must never sit directly under the heat source.
- Feeders and drinkers alternated, so that no bird has far to go.
- In strong heat: raise the feeders about 6 hours before the hottest time of day, then feed again when it is cooler (in the evening and early morning).

Changing feed over three days

Day	Old feed	New feed
Day 1	Two thirds	One third

Day 2	Half	Half
Day 3	One third	Two thirds
Day 4	—	All new feed

Tip: Every change (of phase, supplier or form) is a delicate moment: the flock may shun the feeder and drink less. Never change supplier in the middle of a phase just because an opportunity comes up, and ask what has changed when a bag arrives with a different colour or smell.

6. How much feed by age

The following tables give the targets of the reference strains, achieved in very good conditions. In an open-sided house, in strong heat, actual intake is often lower. Use them to plan your bags and to compare, every day, what your flock is eating.

White broilers (Efficiency Plus strain)

Age	Feed per day	Cumulative feed per bird
7 days	35 g	172 g
14 days	70 g	550 g
21 days	112 g	1,203 g
28 days	152 g	2,148 g
35 days	188 g	3,359 g
42 days	214 g	4,783 g
49 days	230 g	6,350 g

Efficiency Plus — performance objectives (Hubbard)

White broilers (Cobb 500, mixed males and females)

Age	Cumulative feed per bird	Feed conversion ratio (FCR)
28 days	2.36 kg	1.32
35 days	3.64 kg	1.44
42 days	5.10 kg	1.56
45 days	5.78 kg	1.61

Source: Cobb (Cobb500 Performance & Nutrition Supplement, 2022)

Coloured chickens: feed per day

Age	Red broilers	Hybrids
14 days	49 g	32 g
28 days	99 g	65 g
42 days	127 g	83 g
56 days	162 g	106 g
70 days	193 g	126 g
84 days	214 g	140 g

Indicative Hubbard Premium performance

Coloured chickens: total feed per bird by selling age

Selling age	Red broilers	Barred grey	Naked-neck red broilers	Hybrids
56 days	5.1 kg	4.8 kg	5.0 kg	3.4 kg
63 days	6.3 kg	5.9 kg	6.2 kg	4.1 kg

70 days	7.7 kg	7.2 kg	7.5 kg	5.0 kg
84 days	10.5 kg	9.9 kg	10.3 kg	6.9 kg

Indicative Hubbard Premium performance

Brown laying pullets: feed per day

Age	Feed per day	Target weight
1 week	11 g	65 to 70 g
2 weeks	17 g	110 to 120 g
4 weeks	35 g	270 to 285 g
6 weeks	47 g	470 to 495 g
8 weeks	55 g	660 to 695 g
10 weeks	60 g	840 to 900 g
12 weeks	65 g	1,020 to 1,090 g
14 weeks	72 g	1,190 to 1,255 g
16 weeks	78 g	1,350 to 1,425 g
18 weeks	85 g	1,480 to 1,580 g

Source: Novogen Brown, management guide (2024), p. 38

In full production, a brown laying hen eats about 111 to 119 g of layer feed a day.

Tip: To work out the day's ration, multiply the number of birds by the feed per day in the table. Example: 1,000 white broilers aged 28 days × 152 g = about 152 kg of feed a day, roughly 3 bags of 50 kg. If your flock eats clearly less, check the heat, the water and the birds' health; if it eats as much but does not gain weight, look for waste, rats or a disease starting.

Your flock's feed conversion ratio is calculated at the end: feed consumed (feed delivered minus the stock left over) divided by the total liveweight sold. Dead birds have eaten without being sold: the more deaths, the higher the ratio.

Work out the profitability of your flock with your own prices: www.nextekci.com/en/poultry-profit-calculator

7. Water: how much birds drink

Water is the bird's first nutrient: it makes up 65 to 78% of its body depending on age. A broiler drinks about 1.6 to 2 times the weight of the feed it eats, and much more when it is hot. A bird that drinks poorly eats poorly: many "feed problems" are really water problems.



Water tank in the shade, buried pipe, nipple line set at head height. — NEXTEKCI illustration

Water follows the heat

House temperature	Litres of water per 1 kg of feed
20 °C	2 litres
26 °C	2.5 litres
37 °C	5 litres

Source: Cobb (Broiler Management Guide)

- Between 20 and 32 °C, each extra degree increases water intake by about 6%.
- Between 32 and 38 °C, each extra degree increases it by about 5%.
- Above 20 °C, each extra degree lowers feed intake by about 1.2%.

Source: Cobb (Broiler Management Guide)

White broilers: water per day in good conditions (Efficiency Plus strain)

Age	Water per bird per day	Per 1,000 birds
7 days	60 ml	60 litres
14 days	119 ml	119 litres
21 days	190 ml	190 litres
28 days	259 ml	259 litres
35 days	319 ml	319 litres
42 days	364 ml	364 litres
49 days	391 ml	391 litres

Efficiency Plus — performance objectives (Hubbard)

Coloured chickens: water per day in good conditions

Age	Red broilers	Hybrids
14 days	83 ml	54 ml
28 days	169 ml	110 ml
42 days	216 ml	141 ml
56 days	275 ml	179 ml
70 days	329 ml	215 ml
84 days	364 ml	238 ml

Indicative Hubbard Premium performance

Laying hens in production

Temperature	Litres of water per 1 kg of feed	Water per hen per day
20 °C	1.8	205 ml
25 °C	2.1	230 ml
30 °C	3.1	320 ml

Source: Novogen Brown, management guide (2024) (after ITAVI 2012), p. 18

These amounts apply in good conditions: in strong heat, birds can drink up to 3 times what they eat. Plan a water reserve that covers at least 48 hours of peak consumption, to keep going during a pump failure or a power cut.

Tip: Record the water drunk every day, at the same time (meter, or number of drinkers filled). It should rise steadily with age. A drop without any fall in temperature is often the first sign of a problem, before mortality. A sudden rise means looking for a leak, strong heat or feed that is too salty.

8. Water quality

The water given to birds must be fit for human consumption. Clear water is not necessarily clean water: it can carry germs, too much salt, iron or nitrates. Poor-quality water reduces drinking, fouls the drinkers and makes birds ill.

Protecting the source

- Borehole: the best solution when properly built; have the water tested at least once.
- Well: covered, away from latrines and pits, watched closely in the rainy season (seepage).
- Mains supply: reliable water, but the 48-hour reserve is still essential.
- River, pond, rainwater: avoid without treatment.

Guidelines for good-quality water

Item	Normal level	Maximum acceptable level
Total bacteria	0 per ml	100 per ml
Coliforms (faecal bacteria)	0 per ml	50 per ml
pH	6.8 to 7.5	6.0 to 8.0
Nitrates	10 mg/L	25 mg/L
Iron	0.2 mg/L	0.3 mg/L
Sodium	32 mg/L	50 mg/L

Source: Cobb (Broiler Management Guide)

Dissolved salts in water

Dissolved salts (ppm)	What it means
Less than 1,000	Suitable for all poultry
1,000 to 2,999	Suitable; droppings sometimes wetter at the higher levels, with no effect on health
3,000 to 4,999	Not suitable: wet droppings, higher mortality, poorer growth
5,000 to 6,999	Not suitable: almost always causes problems
7,000 and above	Unfit for poultry

Source: Cobb (Broiler Management Guide), after National Research Council (1974)

What a water test helps you correct

- Iron and manganese: give a bitter taste that reduces drinking, and feed bacteria. A filter (40 to 50 micron mesh), checked and cleaned every week, and chlorination help.
- Calcium and magnesium ("hard" water): form scale that blocks nipple drinkers.

- Nitrates: even at low levels they hold back performance; they often point to contamination by sewage or fertiliser.
- pH above 8: bitter taste and chlorine with almost no effect.

Source: Cobb (Broiler Management Guide)

Chlorine works better in slightly acidic water

Water pH	Share of chlorine that actually disinfects
8.0	21%
7.5	48%
7.0	72%
6.5	90%
6.0	96%

Source: Cobb (Broiler Management Guide)

Have the water tested at least once a year by an accredited laboratory, with two samples: one at the source and one at the end of a drinker line, in a sterile container. Know your water's pH before treating it. To correct the pH or chlorinate the water, ask the vet or technician for advice: never improvise a dose.

9. Drinkers, water lines and water temperature

A slimy layer, called biofilm, builds up inside pipes and drinkers: it is a layer of bacteria where dangerous germs hide from disinfectants and feed. Regular cleaning is the only way to stop it taking hold.



Automatic bell drinker: lip at the height of the birds' backs, washed every day.

How many drinkers

Drinker	Number	Height
Brooding (mini-drinkers, founts)	14 to 16 per 1,000 chicks, about 1 per 80 to 100 chicks	On the litter for the first days, then slightly raised
Bell drinker (hanging)	1 per 80 to 100 birds	Lip at back height; 1 to 2 cm of water
Nipples (broilers)	1 per 10 to 12 birds	At chick eye level, then just above the head
Nipples (laying hens)	1 per 10 hens at 30 °C (1 per 20 at 25 °C)	Just above the head

Maintenance during the flock

- Open drinkers (founts, bells) scrubbed every day with a brush.

- Nipple lines flushed at high pressure (1 to 2 bar), ideally every day and at least 3 times a week.
- No bird should have to walk more than 3 m to drink.
- Drinkers raised every week as the birds grow; a ring of wet litter = drinker too low, pressure too high or a leak.
- Water filter checked and cleaned every week.

Source: Cobb (Broiler Management Guide)

Cleaning the water system between flocks

1. Drain the system and the tank.
2. Take the tank out if possible and scrub it.
3. Prepare the cleaning solution following the manufacturer's instructions; wear gloves and eye protection.
4. Pour the solution into the tank, open the end of each line until the solution comes through, then close it.
5. Leave the solution to act for at least 12 hours if it cannot circulate.
6. Drain, then flush thoroughly with clean water to remove the biofilm and the product before the chicks arrive.

Source: Cobb (Broiler Management Guide)

Cool water

- Birds refuse water that is too warm: above 30 °C, intake drops. Between 18 and 25 °C is good; cooler is better still.
- Tanks in the shade or painted white, pipes buried or covered: a black pipe in the sun gives scalding water by midday.
- In the hottest hours, empty the lukewarm water from drinkers and replace it with cool water from the reserve.
- When the chicks arrive, water at room temperature (about 20 to 25 °C), neither cold nor hot.

Tip: Vitamins, vaccines, medicines: any product goes into the water only on the vet's prescription, at the dose and for the duration they set. Prepare only the water the flock will drink in 2 to 4 hours, and never put chlorine or bleach in the water on a vaccination day: the disinfectant kills the vaccine.

10. Signs of a feed or water problem

A feed or water problem shows first on the record sheet (intake, growth), then in the droppings and the birds' behaviour. This table helps you look for the cause; it does not replace the vet's opinion when birds are sick or dying.

What you see, what to check

What you see	Possible causes	What to do
Birds eat less	Heat, too little or too warm water, new feed refused, spoiled bag, disease starting	Check the water and the heat, open and smell the bag; call the vet if it lasts
Feed disappears but birds do not gain weight	Waste, rats, badly adjusted feeders, disease	Adjust the feeders, control rats, weigh a sample of birds
Water intake jumps suddenly	Leak, strong heat, feed or water too salty	Find the leak, check the feed and the water test
Very wet droppings across the flock	Too much salt or dissolved salts in the feed or water, digestive problem	Keep a feed sample, have the water tested, call the vet
Undigested feed in the droppings	Digestive disorder, poor-quality feed	Call the vet, keep a sample
Uneven flock, slow growth	Too little feeder space, wrong feed phase, poor feed quality, water	Count feeders and drinkers, check the bag in use
Lameness, weak legs	Mineral or vitamin imbalance, growth too fast, disease	Call the vet; report to the supplier with the sample

Thin shells, drop in laying	Too little calcium, layer feed started too late, heat, change of feed, disease	Check the layer feed; vet within 24 hours
Mortality rising after a new batch of feed	Mycotoxins, manufacturing error	Stop that batch, call the vet and the supplier

If you suspect the feed

1. Stop the suspect batch and, if possible, go back to the previous batch that was working well.
2. Keep the delivery sample, the bag label and the delivery note.
3. Write on the record sheet what changed: date of the new batch, intake, water, deaths.
4. Call the vet in your area, with the record sheet, photos and the sample.
5. Inform the supplier: they must take back spoiled bags and can have the feed analysed.

Warning signs and diseases in the poultry health and biosecurity guide:
www.nextekci.com/en/school/guides/poultry-health-and-biosecurity

11. Common mistakes

The costliest mistakes

Mistake	What it costs	Good practice
Giving finisher or layer feed too early	Slower growth, damaged kidneys in pullets	One feed per phase, at the right age
Changing feed all at once	Flock shuns the feeder, growth lost	Three-day changeover
Changing supplier mid-phase for a one-off opportunity	Days of growth lost	Change at the start of a phase, after asking questions
Feeding maize alone, or at the starter stage	Protein, mineral and vitamin deficiencies	Complete feed; maize only as a finisher supplement
Storing bags on the floor, against the wall or in the bird house	Damp, mould, rats	Separate dry store, pallets, first in first out
Feeding a mouldy bag "so as not to waste it"	Mycotoxins: damaged liver, deaths	Bag set aside and taken back by the supplier
Filling feeders to the brim or setting them too low	Up to 5 to 10% of feed wasted	Fill to one third, lip at back height
Leaving feeders or drinkers empty	Growth lost, uneven flock	Check on every round
Letting water heat up in the sun	Birds drink and eat less	Tanks in the shade, pipes covered, water renewed
Dirty drinkers, lines never flushed	Biofilm, digestive diseases	Daily washing, flushing at least 3 times a week
Putting products in the water "just in case"	Resistance, confused diagnosis, residues	Only on the vet's prescription
Not recording water and feed	Problems spotted too late	Record sheet filled in every day, at the same time

Tip: The most profitable check on the farm: count the bags. Bags received minus bags fed out equals bags in stock. Do it every week, yourself.

12. Feed and water checklist

Every day

- Record the feed given and the water drunk, at the same time, and compare them with the day before and with the tables.
- Wash the open drinkers; check that every nipple delivers water.
- Check the feeders: never empty, never full to the brim, at the right height.
- In the hottest hours: cool water renewed, feeders raised.
- Look at the litter around the drinkers and at the droppings.

Every week

- Raise feeders and drinkers as the birds grow.
- Flush the water lines (at least 3 times a week); clean the filter.
- Count the bags in stock and plan the next delivery and the next feed change.
- Weigh a sample of birds and compare with the targets.

At each feed delivery

- Check the label, the bags and the look of the feed.
- Write the date of receipt on the bags and stack them on pallets.
- Keep a sample until the flock is sold.

Between two flocks

- Empty the remaining feed, clean the store, the feeders and the bins.
- Clean the tank and the water system, then flush thoroughly.
- Have the water tested at least once a year (source and end of line).

A question about feed or water? Message a NEXTEKCI adviser on WhatsApp: <https://wa.me/2250544832779>

Go further with the NEXTEKCI School lessons: www.nextekci.com/en/school