

It all comes back to wet litter.

Two breeder handbooks — Ross and Cobb — read straight from the tables.

One litter number sits under everything else

Litter moisture — keep it below 35% (Cobb)

Below 35% the litter stays friable and keeps absorbing. Past it, litter cakes, pH climbs, ammonia volatilises and feet start to burn.

< 35%

friable — OK

caked

ammonia ↑

clumps

footpad ↑

The squeeze test is the field check: a handful should crumble open. If it holds together in a clump, it is too wet. Ross reads the same thing as "friable" and with a grain-moisture meter. One number, two names — and the hinge of the whole house.

The in-house gas limits — where Ross and Cobb agree

CONTAMINANT	ROSS	COBB	VERDICT
Ammonia (NH ₃)	< 10 ppm	< 10 ppm	agree
Carbon dioxide (CO ₂)	< 3,000 ppm	< 3,000 ppm	agree
Carbon monoxide (CO)	< 10 ppm	< 10 ppm	agree

Ammonia < 10 ppm and CO₂ < 3,000 ppm are effectively universal — two independent breeders, the same limits. Ross adds the warning steps: NH₃ is smelt at 20 ppm, damages the lung surface above 10, and may cut growth above 25. If you can smell it, act.

Where they differ — humidity and dust

Humidity

Ross: 50-60% after brooding
Cobb: < 65% relative humidity

A band vs a ceiling — same intent, drier is safer.

Dust

Ross: "keep to a minimum"
Cobb: < 3.4 mg/m³ respirable

Cobb puts a number on it; Ross keeps it qualitative.

Get the depth right for the material you use

COBB — minimum depth / volume on a concrete floor

Dry sawdust	2.5 cm (1 in)	Rice hulls	5 cm (2 in)
Sunflower husks	5 cm (2 in)	Chopped straw	1 kg/m ²
Straw pellets	0.8-1 kg/m ²		

Ross spreads litter evenly to 2-4 cm (0.8-1.6 in) at placement, going >4 cm in colder regions for insulation. Cobb sets a minimum per material. Earth floors need ≥10 cm (4 in) either way — insulation and moisture-holding both depend on it.

Why it all comes back to the litter

Wet litter

moisture climbs past ~35%, litter cakes

Ammonia

alkaline caked litter releases NH₃ into the air

Burnt feet

the primary cause of footpad dermatitis and hock burn

The rule this deck is arguing for

Ross names it outright: the primary cause of footpad dermatitis is wet and caked litter. Ammonia, hock burn and downgrades are not separate problems — they are the litter, seen from three angles. Hold the moisture under 35% and the rest follows.

Based on Aviagen Ross Broiler Handbook 2025 (Section 6 — Table 6.1, Table 6.4, Figure 6.31) and Cobb Broiler Management Guide 2021 (§2.7 Litter Management; §9.1 air-quality guidelines).

The gases, in full — and where the two guides part

Ross Table 6.1 (air contaminants) and Cobb §9.1 (air-quality guidelines)

CONTAMINANT	ROSS 6.1	COBB 9.1	MATCH
Ammonia (NH ₃)	< 10 ppm	< 10 ppm	same
Carbon dioxide (CO ₂)	< 3,000 ppm	< 3,000 ppm	same
Carbon monoxide (CO)	< 10 ppm	< 10 ppm	same
Relative humidity	50-60%*	< 65%	close
Respirable dust	minimum	< 3.4 mg/m ³	cobb
Oxygen (O ₂)	—	> 19.6%	cobb

* Ross humidity target is "after brooding"; brooding itself runs wetter (RH 60–70%).

The ammonia warning ladder (Ross)

< 10 ppm ideal. Detectable by smell at 20 ppm. Above 10 ppm it damages the lung surface; above 20 ppm it raises susceptibility to respiratory disease; above 25 ppm it may cut growth rate, depending on temperature and age. The nose is a real gauge here.

The CO₂ and CO warnings (Ross)

CO₂ above 3,500 ppm causes ascites and is fatal at high levels — a cold-weather, min-vent risk when operators cut airflow to hold heat. CO above 50 ppm affects bird health and is fatal high — almost always a faulty or unvented heater. Both are silent.

What page 1 compressed into one row

On the gas limits the two breeders agree; on humidity and dust they differ only in how hard they put a number on it. There is no serious dispute here — treat these as settled.

Litter moisture — below 35%, or the house turns

Cobb §2.7 — the squeeze test and the <35% target; Ross — friable litter

What "below 35%" actually buys you

Litter under 35% moisture stays friable — loose and open — so it keeps absorbing water from droppings and drinkers, keeps its insulating loft, and stays too dry for ammonia to volatilise fast. Cross 35% and every one of those protections starts to fail at once.

THE SQUEEZE TEST — read it in several spots, away from drinkers

Crumbles open

friable, < 35% — good

Holds loosely

borderline — watch the drinker line

Stays in a clump

too wet — de-cake and fix the cause

Why it climbs — and where first

Litter moisture is not uniform. It rises first and fastest under the drinker line and in cold, poorly-ventilated corners, then spreads. A flock average hides a wet stripe that is already caking and gassing while the rest of the pad still reads dry.

How to measure it properly

The squeeze test is the fast field check; Ross also uses a grain-moisture meter for a number, and samples for pathogens. Sample several spots, and specifically the wet ones — one dry handful by the wall is not the house.

The point page 1 leads with

Every other number on this deck — ammonia, hock burn, downgrades — moves with this one. If you fix a single thing in the house, fix litter moisture.

Depth and material — the litter's absorptive reserve

Cobb §2.7 minimum depths; Ross Table 6.4 litter materials

MINIMUM DEPTH / VOLUME — CONCRETE FLOOR (COBB)

MATERIAL	
Dry sawdust	2.5 cm (1 in)
Chopped straw	1 kg/m² (0.2 lb/ft²)
Straw pellets	0.8-1 kg/m² (0.15-0.2 lb/ft²)
Rice hulls	5 cm (2 in)
Sunflower husks	5 cm (2 in)
Earth floor (any)	≥ 10 cm (4 in)

Ross reads depth by climate, not by material

Spread evenly to 2-4 cm (0.8-1.6 in) at placement. Go above 4 cm in colder regions for insulation; reduce it only where litter disposal is a real constraint. Too deep and bird movement, feed and water access all suffer — depth is a reserve, not a cushion to pile on.

Choose the material for how it handles water

Kiln-dried sawdust: excellent absorption. Chopped straw: wheat beats barley, and it must be chopped to ≤2 cm (3/4 in) or it cakes. Hardwood shavings can carry tannins. Rice hulls are cheap but hold little water; general sawdust risks mould and aspergillosis if damp.

Why depth and material sit on this deck

Depth and absorbency are the litter's buffer against the moisture on page 3. Get either wrong and the pad saturates early — the same wet-litter chain, started at placement.

THE COST

Wet litter → ammonia → burnt feet

Ross — primary cause of footpad dermatitis is wet and caked litter

The causal chain, stated plainly

Wet, caked litter turns alkaline and releases ammonia into the air the birds breathe, and the same wet pad sits in constant contact with their feet and hocks. Ross: "the primary cause of FPD is wet and caked litter." Cobb ties high litter moisture directly to foot-pad lesions, high ammonia and other welfare problems in one sentence.

WHAT WET LITTER PRODUCES

Footpad dermatitis (FPD)

contact burns on the footpad — painful, and a downgrade at the plant

Hock burn

the same lesion on the hock joint; both track litter moisture

Ammonia load

volatilised off the caked pad — respiratory and growth cost

Why this is an economic problem, not only welfare

Footpad dermatitis raises carcass downgrading and, in some markets, the feet are a sold product with their own value. Ross flags monitoring FPD as the signal for whether more litter is needed — the feet are a running readout of litter condition you already have.

The fix is upstream, not on the foot

You do not treat FPD on the bird; you keep the litter under 35% and well ventilated so the lesion never forms. Manage the moisture (page 3) and the causes (page 6) and the feet look after themselves.

THE CAUSES

Six places wet litter comes from

Ross Figure 6.31 — causes of poor litter quality



You manage what you can see — and litter is barely seen

The squeeze test is a spot check; litter moisture moves by the square metre

The gap in how litter is watched today

Air temperature and humidity are logged continuously by the house controller. Litter moisture — the number this whole deck turns on — is checked by hand, occasionally, in a few spots, by whoever is walking the house. Between those checks, a wet stripe under a leaking drinker can cake and gas for a day before anyone squeezes a handful.

Litter moisture

The number every other one depends on — and the one measured least.

Ammonia at bird level

Smelt at 20 ppm; by then the caked litter is already the problem.

The feet

A running readout of litter condition — but only seen at thinning or slaughter.

What it would take to close it

Not a new limit — the limits are settled and agreed. It would take seeing litter condition continuously, across the whole floor rather than a handful of spots, so the wet stripe is caught while it is still a stripe, not after it has become a caked pad and a pen of sore feet.

Save this and check one thing tomorrow

Walk the drinker line and squeeze the litter directly under it, not by the wall.
If it holds in a clump, the house has already turned — whatever the controller says.

Based on Aviagen Ross Broiler Handbook 2025 (Section 6) and Cobb Broiler Management Guide 2021 (§2.7, §9.1). Full provenance: 01-monday/SOURCES.md