Gut Health
on the Farm

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START

GUT HEALTH ON THE FARM

ESOPHAGUS

CROP

Storage of food and some early fermentation by the bacteria that line the crop.

Ensuring optimal crop fill during the first 48 hours on the farm is important for chick development.

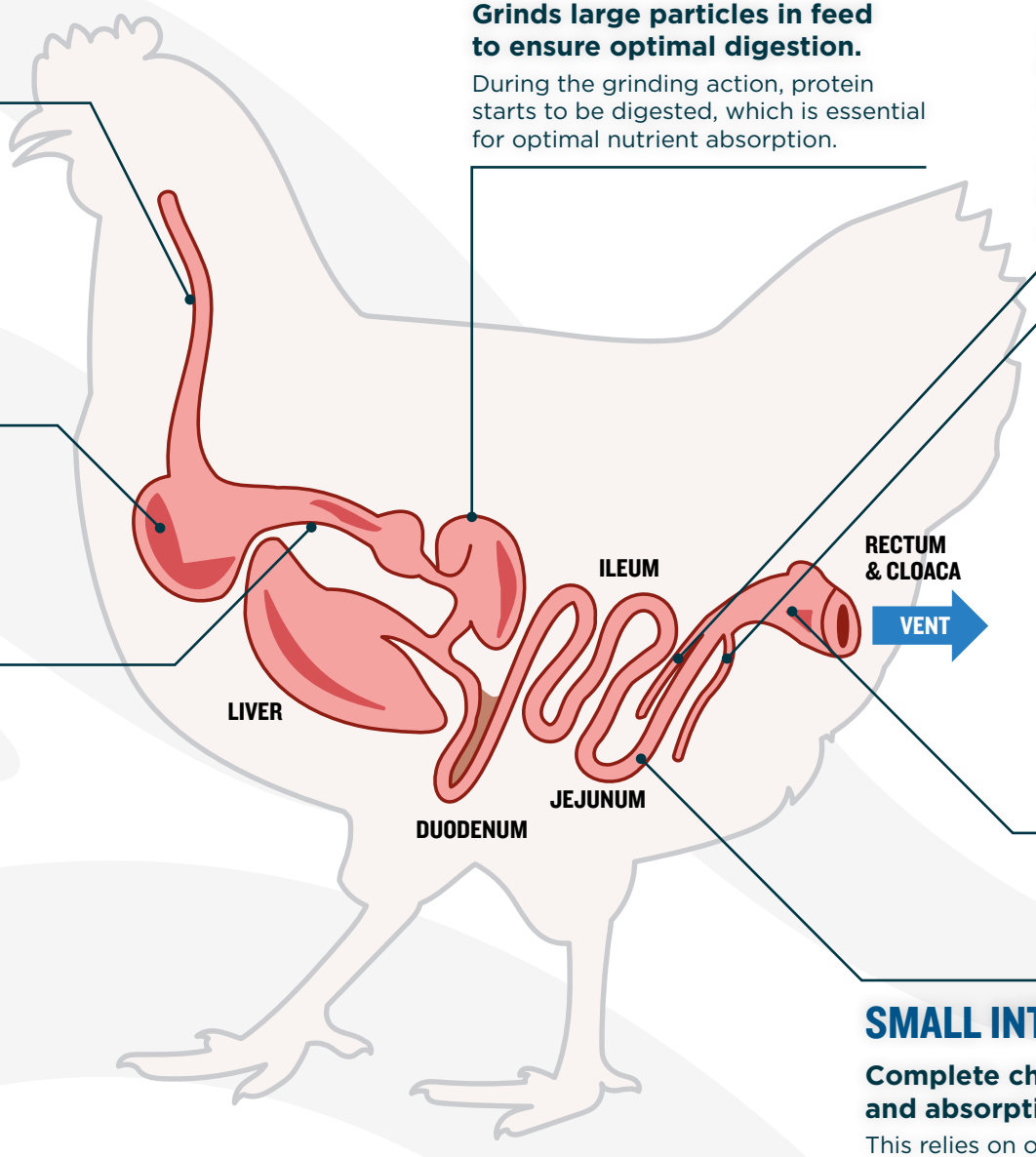
PROVENTRICULUS

Responsible for initiating protein digestion through secretion of hydrochloric acid and the enzyme pepsin.

GIZZARD

Grinds large particles in feed to ensure optimal digestion.

During the grinding action, protein starts to be digested, which is essential for optimal nutrient absorption.



CECA

Major site of bacterial fermentation where microbes produce vitamins, organic acids, and short-chain fatty acids from the non-digestible components of the feed.

COLON

Predominately involved with water absorption and final formation of fecal droppings.

SMALL INTESTINE

Complete chemical breakdown and absorption of nutrients occurs.

This relies on optimal villi development and correct gizzard function.

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The requirements of the gut depend on **bird age and management factors on the farm**

DEVELOPMENT

Gut tissues

Gut immunity

Gut microbiota

This phase is the early part of life where the gut is set up for the lifespan of the bird.

TRANSITION

Feed changes

Vaccinations

Environmental

Handling

This phase occurs during periods when there is a change in the bird's life that could disrupt the gut.

The goal during this phase is to prevent a reduction in nutrient absorption and overgrowth of less favorable bacteria.

MAINTENANCE

Gut has developed

Stable microbiota

Promote integrity

During this phase, the gut is fully developed, and the aim is to ensure the gut is supported to conserve homeostasis.

Top Tip

Understanding what the gut needs at any time in the bird's life ensures we provide the bird with the support it needs, when it needs it.

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Good gut health starts with brooding

Ensure good cleaning and downtime between flocks

Ensure correct brooding conditions

Ensure correct feed composition and quality

Ensure optimal water sanitation

Top Tip

Good 7-day body weights help to ensure good early gut development.

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Water sanitation protocol

1

Ensure adequate cleaning between flocks

Remove biofilm
e.g., 50 ppm hydrogen peroxide in lines for 24 hours, then flush

Remove scale
Target a 5 pH by using a weak acid (e.g., citric acid) for 24 hours, then flush

2

Prior to bird arrival

Use sanitizer in standing water after cleaning

Flush with fresh, sanitized water just before birds arrive

3

Throughout the life of the flock

Sanitize
e.g., chlorine, chlorine dioxide, hydrogen peroxide

Acidify the water
i.e., 5.5–6.5 pH

Biofilms can form in 6 weeks, so flushing lines with hydrogen peroxide during the life of a breeder flock can be beneficial

Scan this QR code for the Aviagen Brief: Water Line Sanitation

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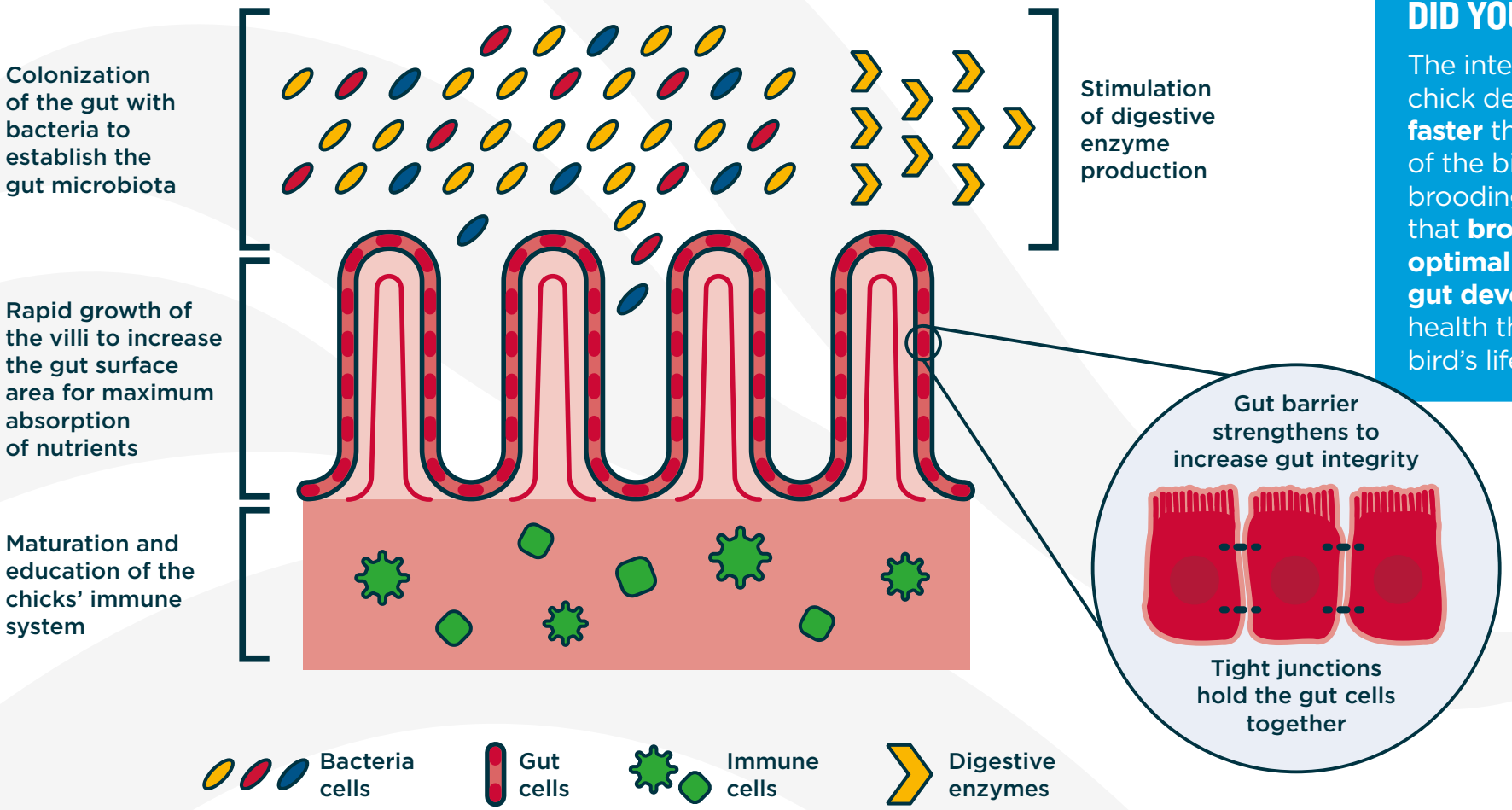
Gut surface development during brooding



DID YOU KNOW?

The intestinal tract of a chick develops **four times faster** than any other part of the bird's body during brooding. This means that **brooding is the optimal time to promote gut development** for gut health throughout the bird's life.

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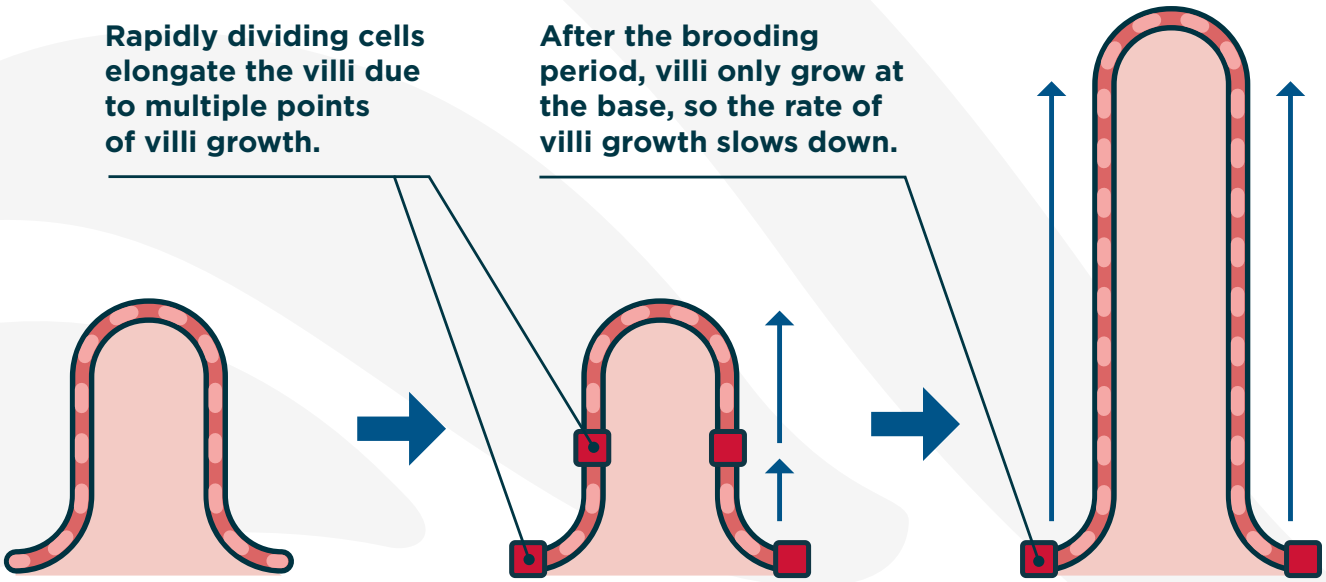
Gut surface development during brooding

Villi Development



DID YOU KNOW?

Part of the reason for improved biological efficiency is that the modern broiler has longer villi than heritage breeds. **Longer villi mean more surface area for optimal nutrient absorption**.

If villi growth is not optimal during brooding, the surface area of the gut will be reduced throughout the life of the bird, which will impact efficiency.

Top Tip

Application of probiotics or organic acids during brooding can stimulate villi development.

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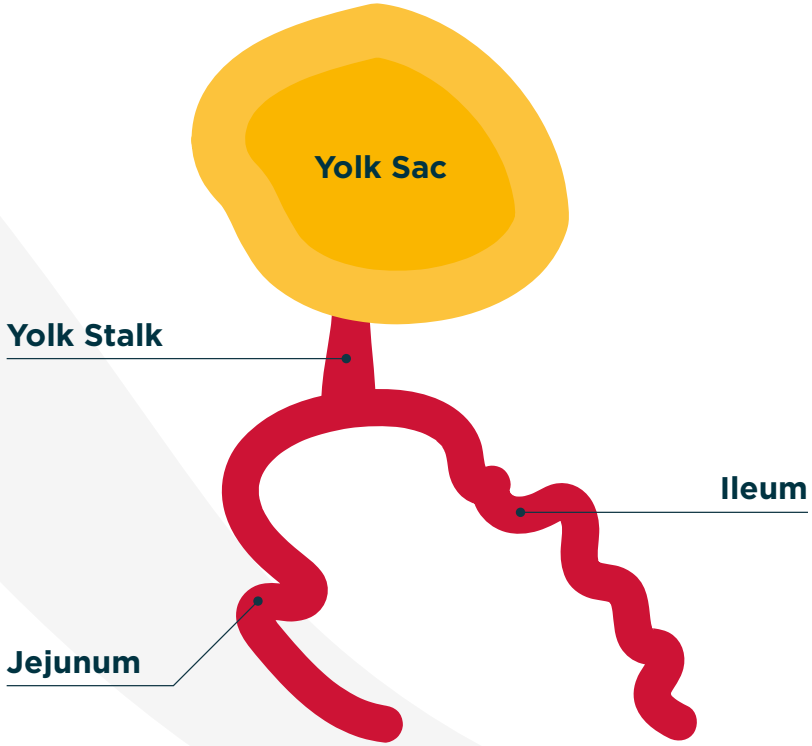
Common gut issues seen during brooding

Retained yolk sac

- The yolk sac is absorbed after hatch, providing chicks **with nutrients and essential maternal antibodies**.
- It is usually absorbed in **2–3 days**.
- If brooding conditions are not optimal, the contents are not absorbed, **leading to a retained yolk sac**.



Top Tip

Yolk sac absorption relies on a comfortable chick.

- Do the chicks have good access to feed and water?
- Is the temperature and ventilation correct?

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Common gut issues seen during brooding

Black gizzard surface

- This is usually a sign of **dehydration after hatch**.
- It is caused by **rupture of the small blood vessels** on the gizzard surface.
- When the blood comes into contact with the acidic gizzard contents, **it turns black due to the stomach acid**.

Top Tip

As long as the chicks get good access to feed and water, the gizzard will rapidly repair itself.

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Common gut issues seen during brooding

Pasty vents

- **Dehydration**
  Heat stress can impact gut function and increase the risk of dehydration.
- **Cold stress**
  This can reduce chick activity and impact intestinal function.
- **Incorrect feed formulation**
  Diets that increase intestinal viscosity increase the risk of pasty vents.
- **Poor water quality**
  This can introduce pathogens to the chicks, impacting gut health.

Checking gut health
throughout the life of the flock

Examples of normal cecal (left) and fecal (right) droppings.

- The droppings give **a quick and easy indicator of gut health**.
- If the gut is working correctly **the droppings will be normal**.
- **Check the droppings daily**.

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- **Assess the droppings on a daily basis**, as this gives an indication of the status of the gut.
- **If the droppings start to become abnormal**, it is important to act quickly to solve the issue.
- The next page shows **factors that can impact gut health**.

Top Tip

Administer probiotics, organic acids, or phytogenic products for 3–4 days as soon as you recognize a gut health issue. This helps to support the gut while the cause is identified.

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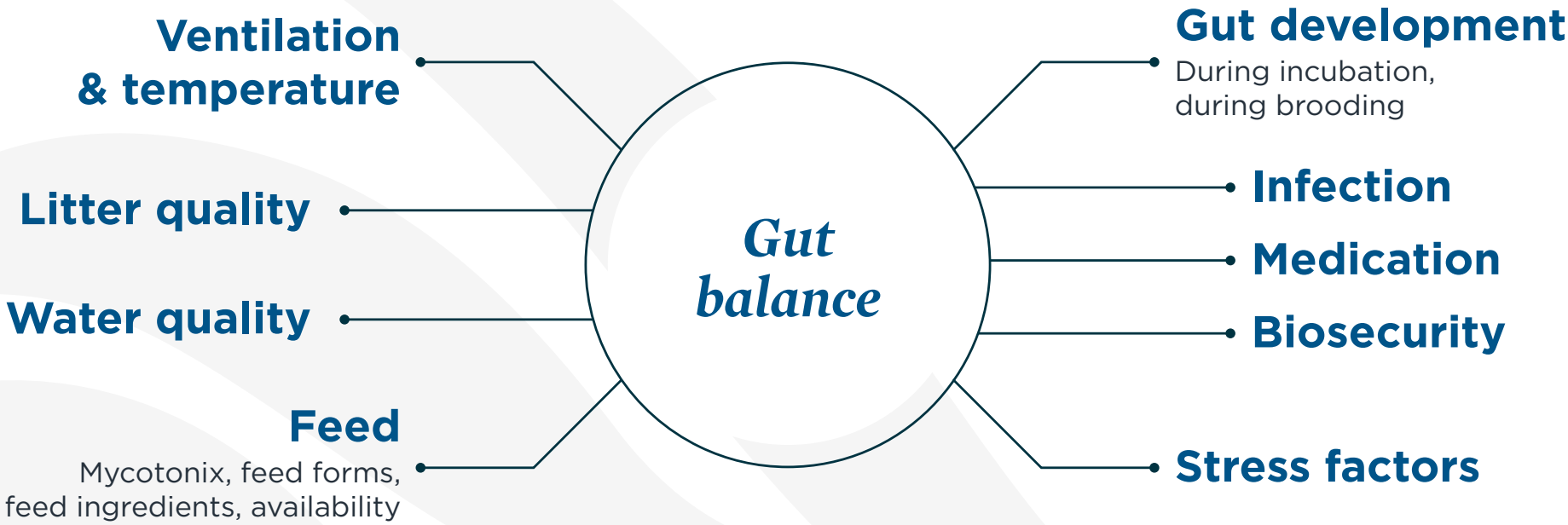
Factors that impact **gut health**



These factors can be additive.

Top Tip

When an intestinal challenge is suspected, it is important to check all these factors to ensure the triggering factor is rectified.

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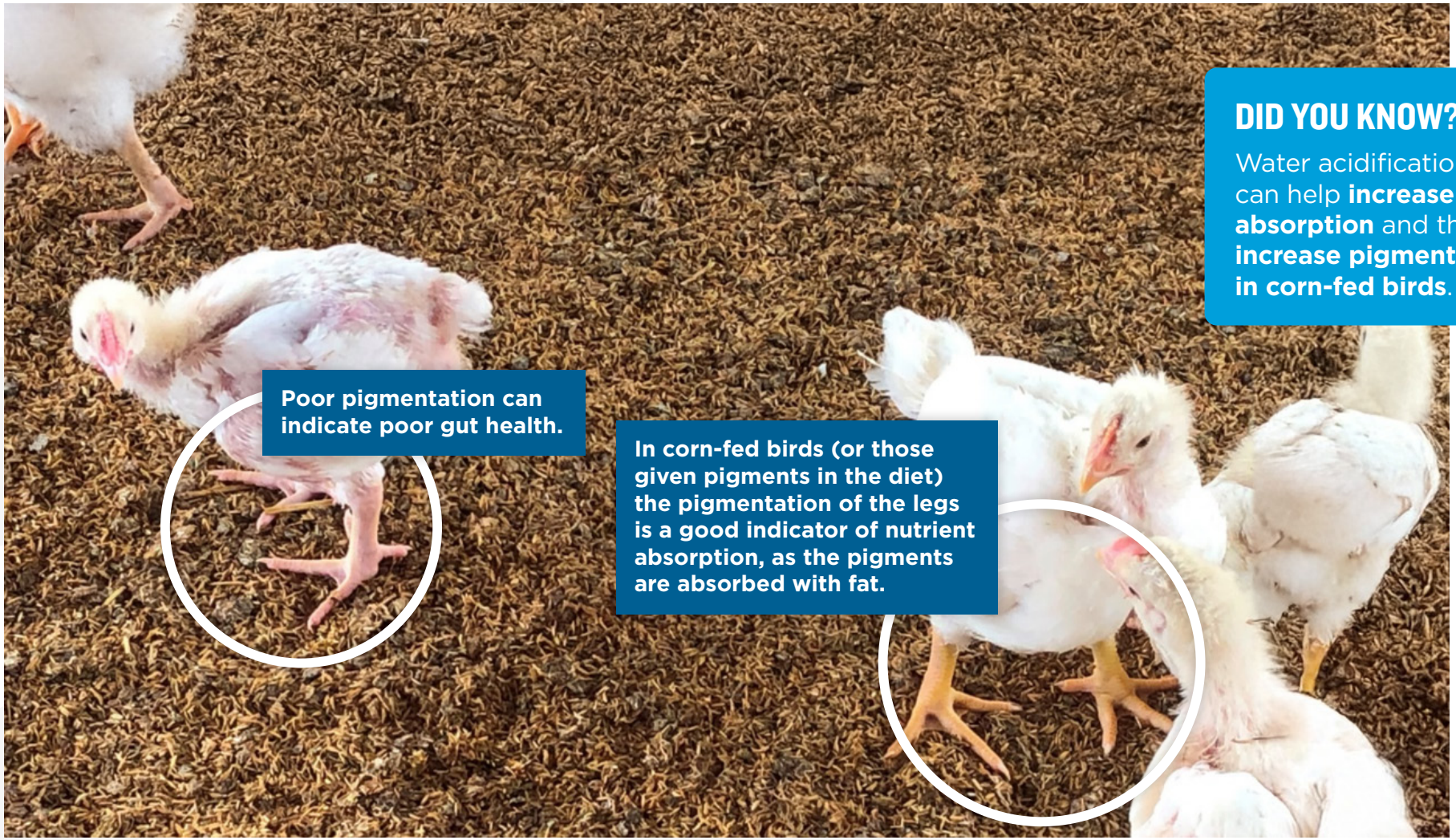
Checking gut health
throughout the life of the flock



DID YOU KNOW?

Water acidification can help **increase fat absorption** and thus **increase pigmentation in corn-fed birds**.

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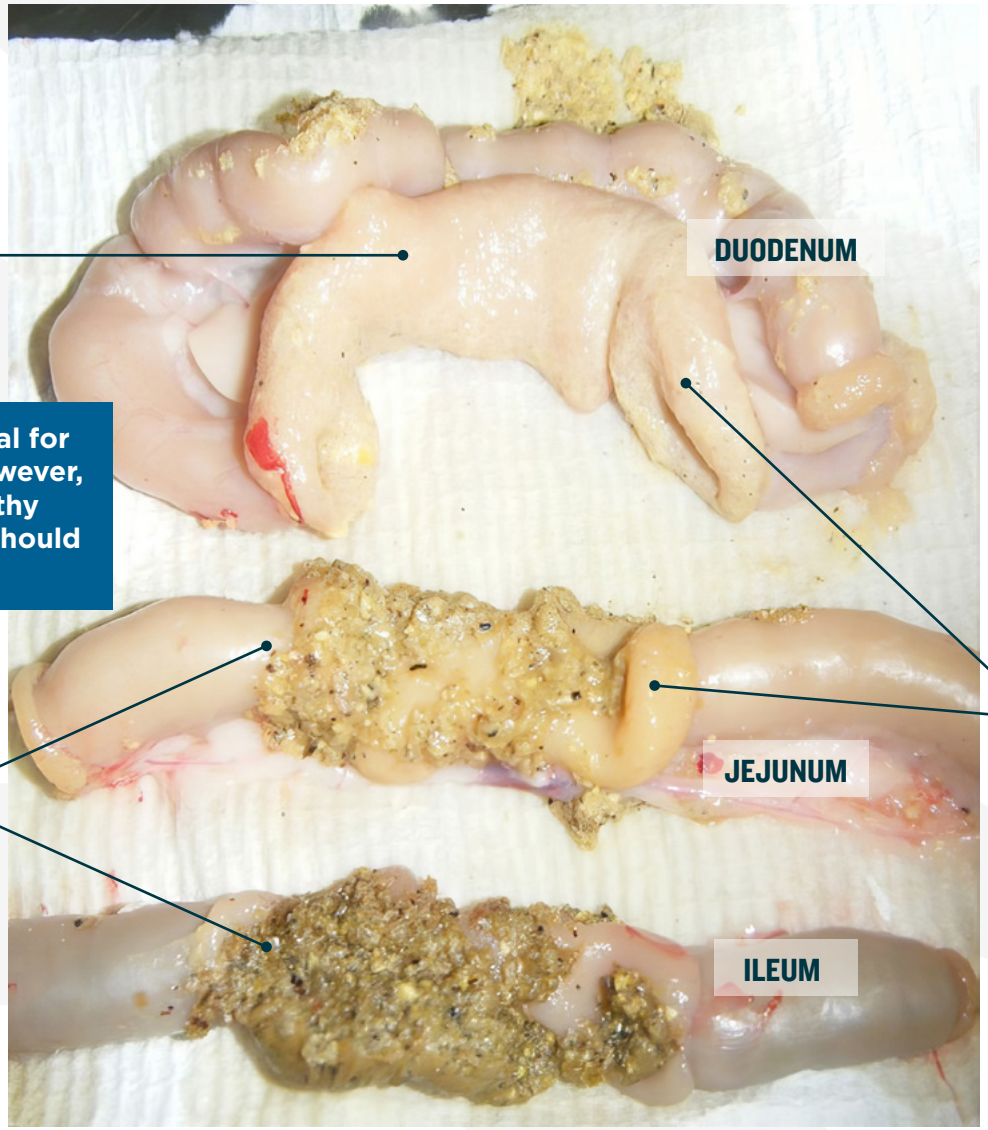
Key features of a **healthy intestinal tract**

The gut surface is pink and free of inflammation.

Mucus is essential for gut function; however, in a normal healthy gut, the mucus should not be obvious.

Gut contents should get darker and firmer as it passes through the small intestine.



The gut wall should fold back rapidly when cut.

DID YOU KNOW?

Assessing gut health should be done on fresh tissues. After about **20 minutes post-mortem**, the gut tissues undergo rapid autolysis, which results in the loss of key gut structures.

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Examples of **abnormalities in the gut**

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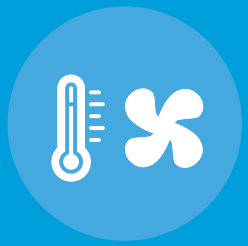
What to check when
faced with a gut health issue



Temperature & ventilation

The birds require a comfortable environment.

Water quality

A robust water sanitation protocol is critical for gut health.

Feed form

Poor feed form can lead to poor digestion and malabsorption.

Feed composition

Sudden changes in the feed can alter the activity of the gut while the bird adapts to the new feed.

Mycotoxin levels

These can cause gut damage and impact the immune system.

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What to check when
faced with a gut health issue

Disease control

Intestinal parasites such as worms and coccidiosis must be controlled.

Biosecurity

A break in biosecurity can be a source of disease in the flock.

Flock history

Poor growth early in the life of the flock could indicate poor gut development.

Antibiotic use

Antibiotics kill pathogens, but they also kill beneficial bacteria. Any antibiotic therapy must be followed by a probiotic to reestablish the microbiota.

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Choosing a **gut enhancement product**

The choice of product depends on the needs of the bird.
Ensure any product you choose has the desired mode of action.

Products

Direct-fed microbials
Probiotics
Competitive exclusion products

Organic acids
Traditional
Protected

Prebiotics

Phytogenics/plant extracts

Mannan oligosaccharides

Bacterial or yeast fermentation products

Feed enzymes

Modes of action

Improve gut integrity

Stimulate or provide a beneficial flora

Improve gut development

Improve gut function

Inhibit pathogens

Scan QR codes for:

Aviagen Brief: Gut Health in Poultry UPDATE

Aviagen Brief: Understanding Gut Health Enhancement Products

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