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business decisions

INTESTINAL INTEGRITY (I²) UK SURVEILLANCE REPORT 2023

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What is HTSi?

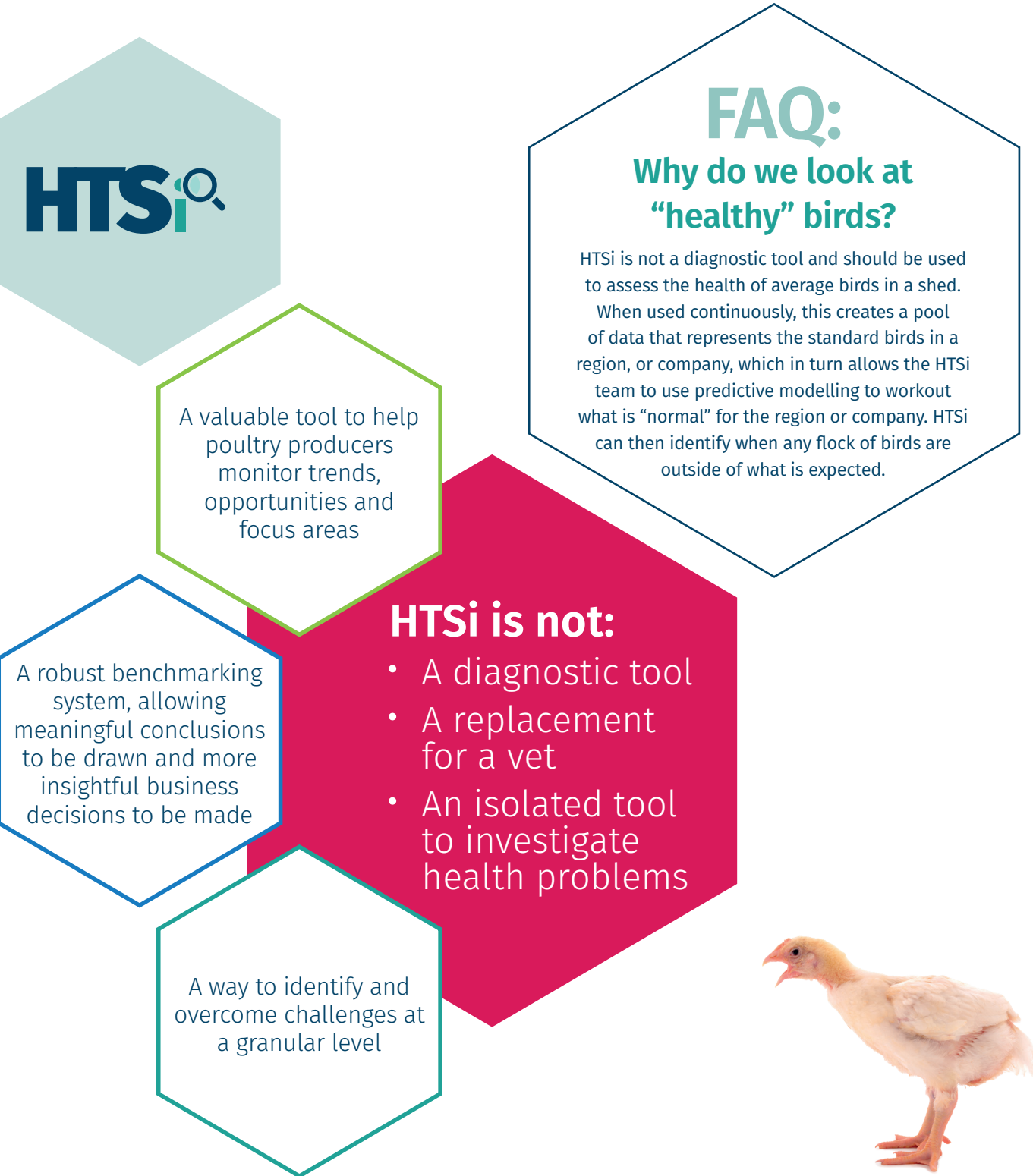
Elanco’s Health Tracking System (HTSi) is an established, independently verified and data led broiler benchmarking platform that incorporates multiple lesions to assess intestinal health, locomotor function, respiratory stability and bird welfare¹.

A globally recognised benchmarking tool, HTSi has been successful in enabling poultry businesses to monitor the health and performance of birds, and better understand whole flock health, helping make decisions towards future improvements.



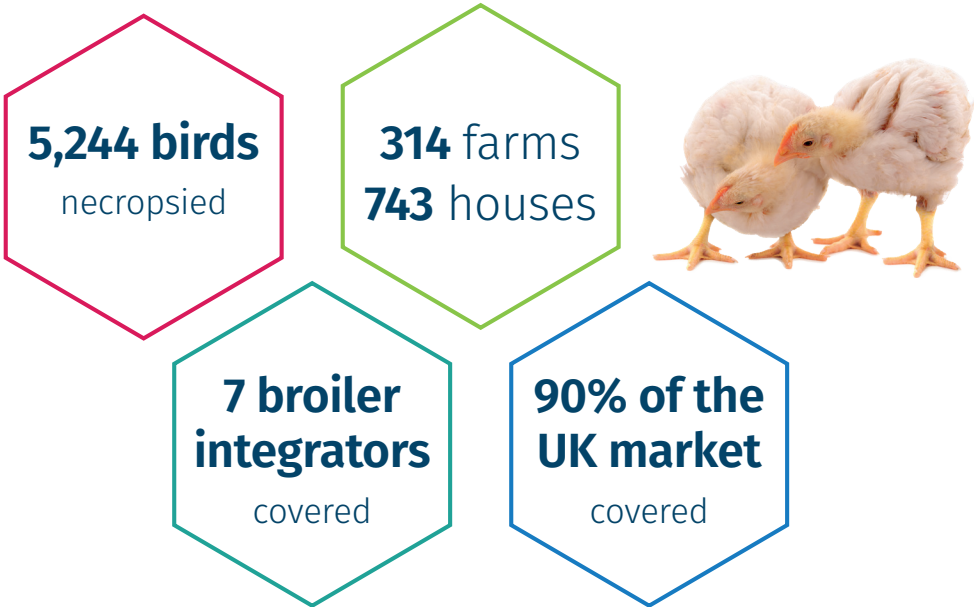
Best Practice HTSi

HTSi enables producers to monitor the general health of their birds. Establishing trends needs consistency in the HTSi sessions, as well as a selection of birds that represent the company. This means birds from a wide range of ages, and from a variety of farms to ensure that data captured is representative of the whole flock health.



2022 in numbers

HTSi continued to collect meaningful data to provide poultry producers with the information to make better business decisions, despite the worst outbreak of Avian Influenza seen in the last 30 years. All sessions are conducted adhering to farm biosecurity rules, ensuring a safe session.

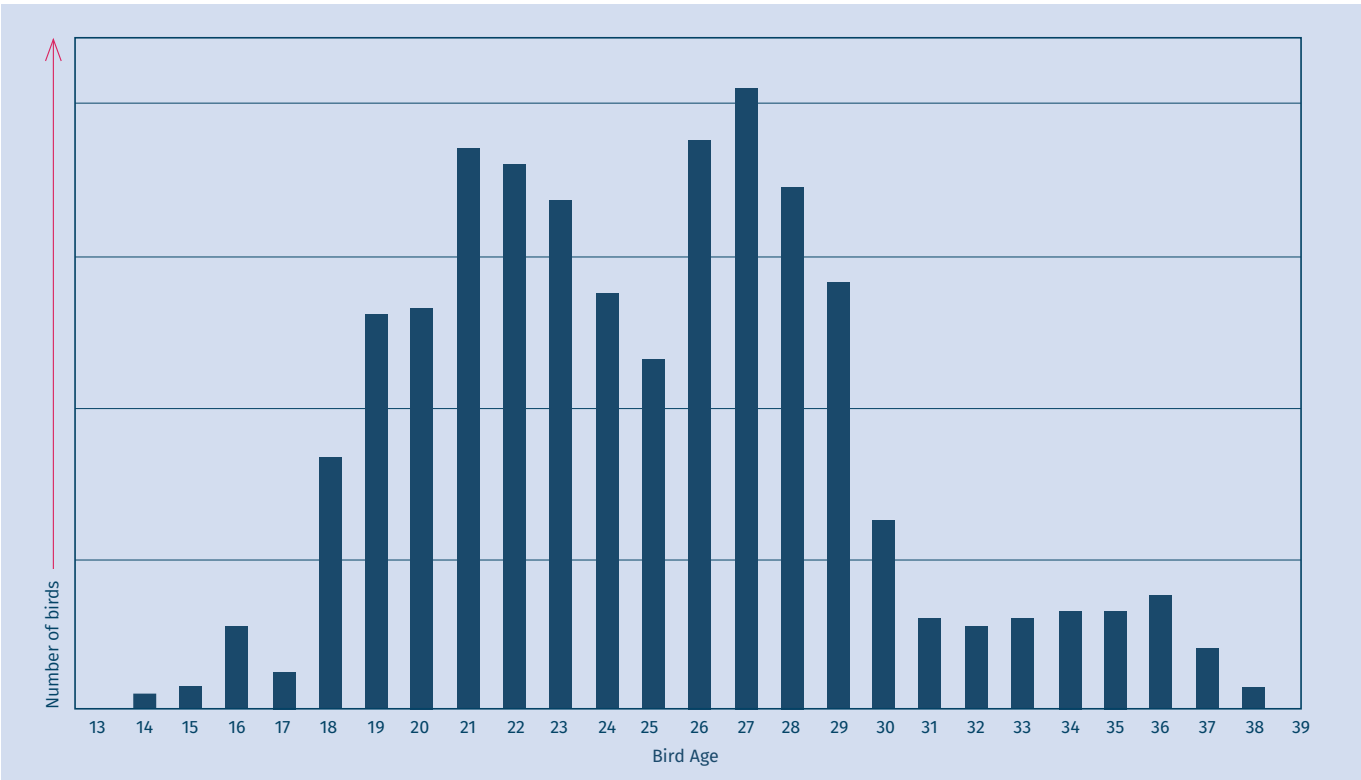


Postings by age

In 2022, HTSi included birds ranging from 14 to 38 days of age, averaging 24.9 days. Most sessions were held between 20 and 28 days of age, covering the main peaks of coccidiosis seen.

Our extensive database ensures a wide range of bird ages can be covered, allowing insights into intestinal health at most ages.

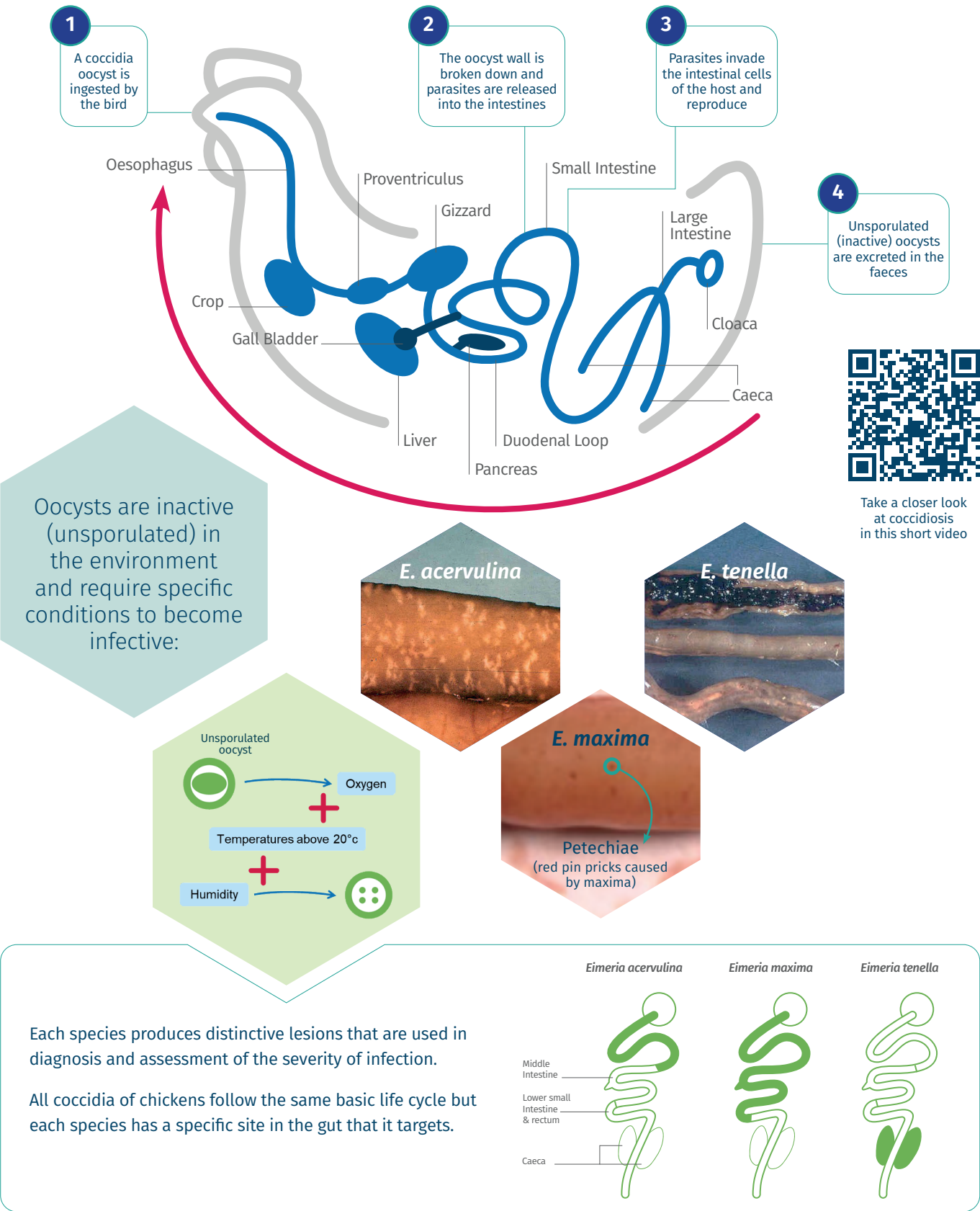
92.4% of birds sampled were Ross 308, 5.8% were Hubbard, and Cobb made up the remaining 1.8%.



Coccidiosis

Coccidia are obligate, intracellular parasites. This means they are restricted to a particular function – in this case, coccidia only affect the intestine. They replicate inside the cells and depend on the bird for energy.

Coccidia life cycle

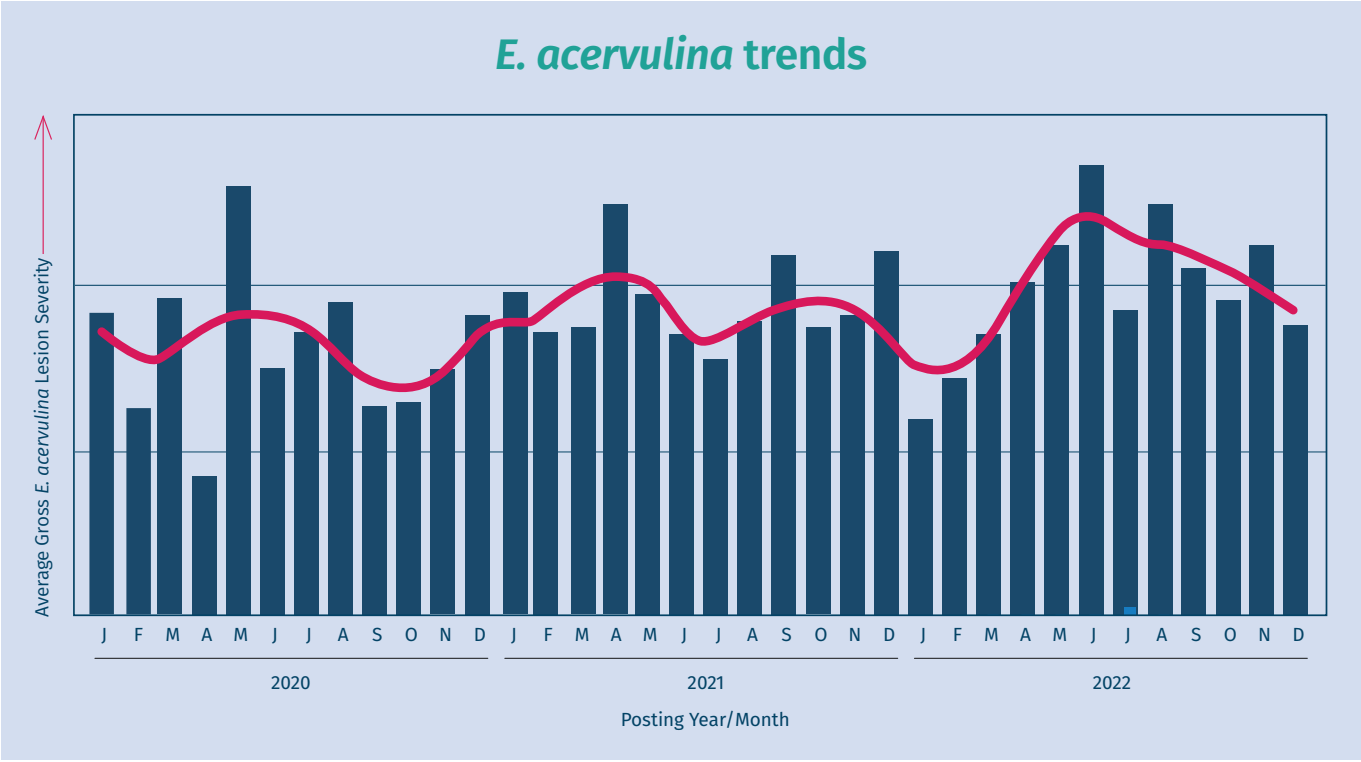


Coccidiosis – *E. acervulina*

The most common species of coccidiosis seen on broiler farms, *E. acervulina* presents as white lesions within the duodenum. These scars on the intestinal wall can impact performance. In 2022, **40.1% of birds were affected by *E. acervulina*** at the time of sampling, an **increase from 37% from the previous year**.



These percentages are similar to the scores seen in 2021.

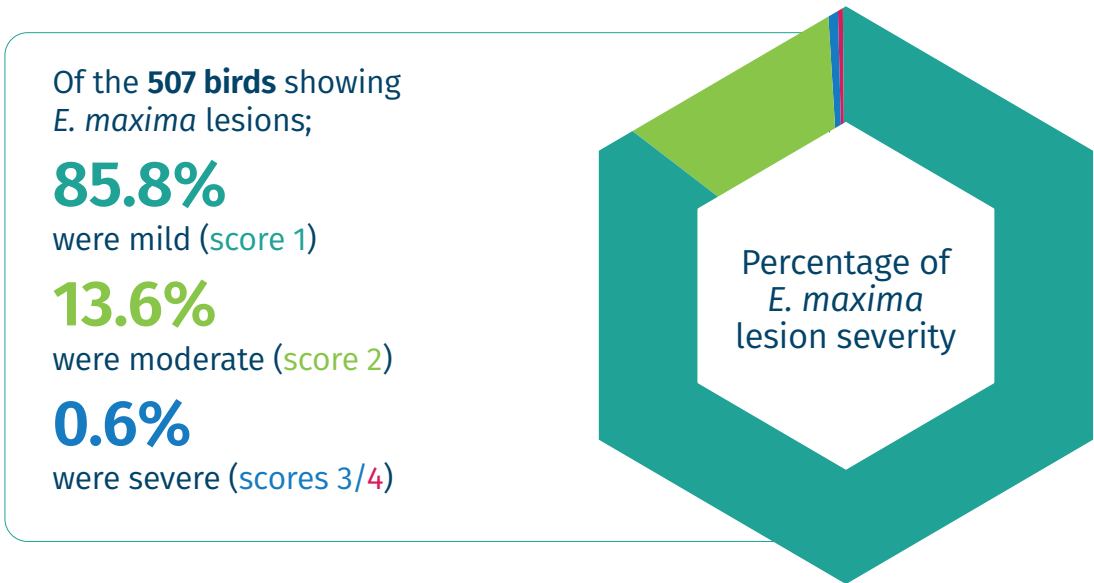


The start of 2022 saw the lowest levels of *E. acervulina* since autumn 2020. Levels increased consistently, at a higher rate than the increase in early 2021, until June. Levels of *E. acervulina* at this point were **the highest across the UK industry in the past four years**. Since June, levels steadily decreased at a slower rate than the initial increase, with levels remaining high as the year ended. This is similar to levels seen in the final quarter of 2021.

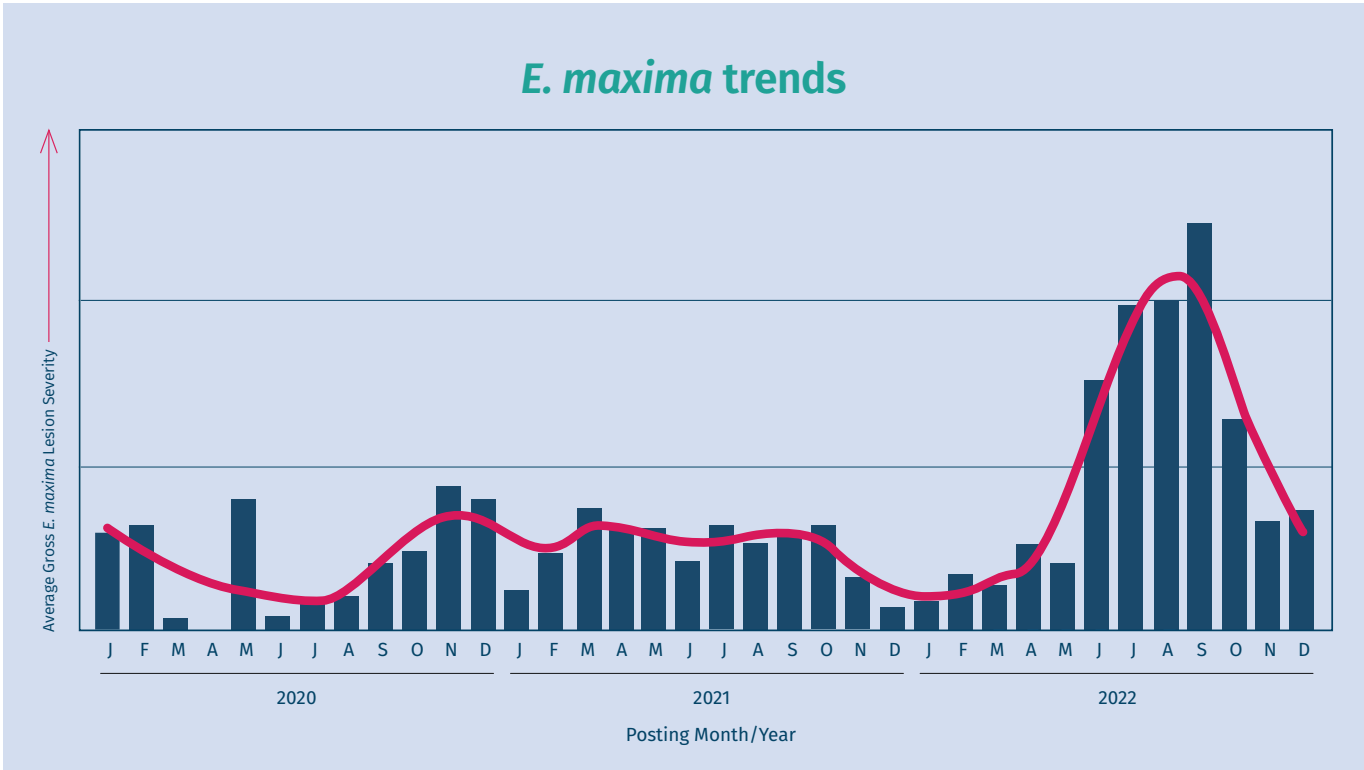
Coccidiosis – E. maxima

As the largest species of coccidiosis, *E. maxima* can cause the most harm to the intestinal tract without causing mortality. Consequently, *E. maxima* infections can cause the most damage to performance, and therefore profits on farm. In 2022, **9.7% of birds presented gross *E. maxima* lesions**, that were confirmed with microscopy at the time of sampling.

This is nearly a **50% increase** from 4.8% in 2021.



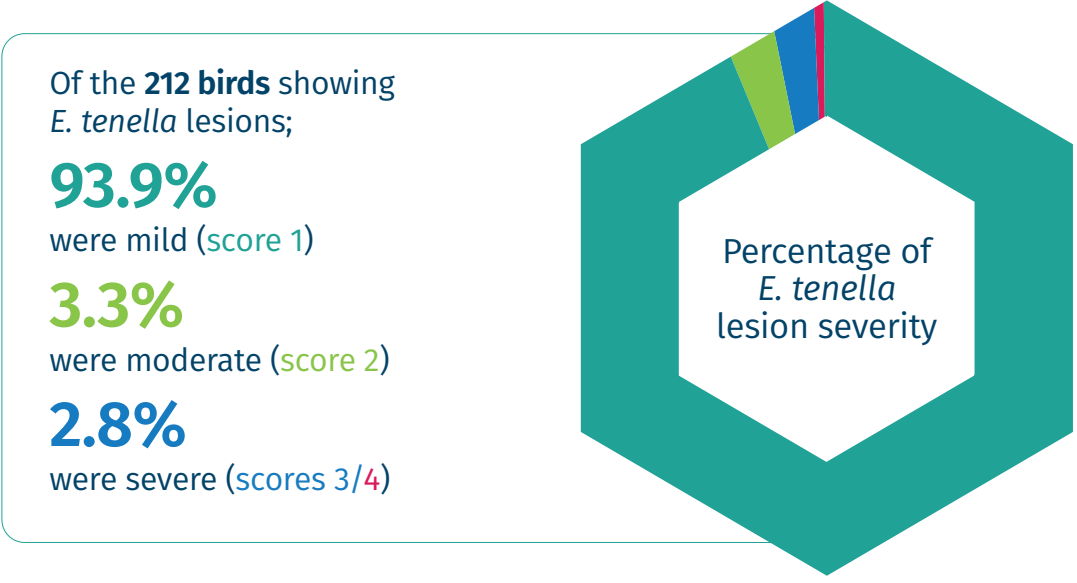
All *E. maxima* lesions seen at HTSi session are sampled and confirmed by microscopy to ensure accuracy in reporting.



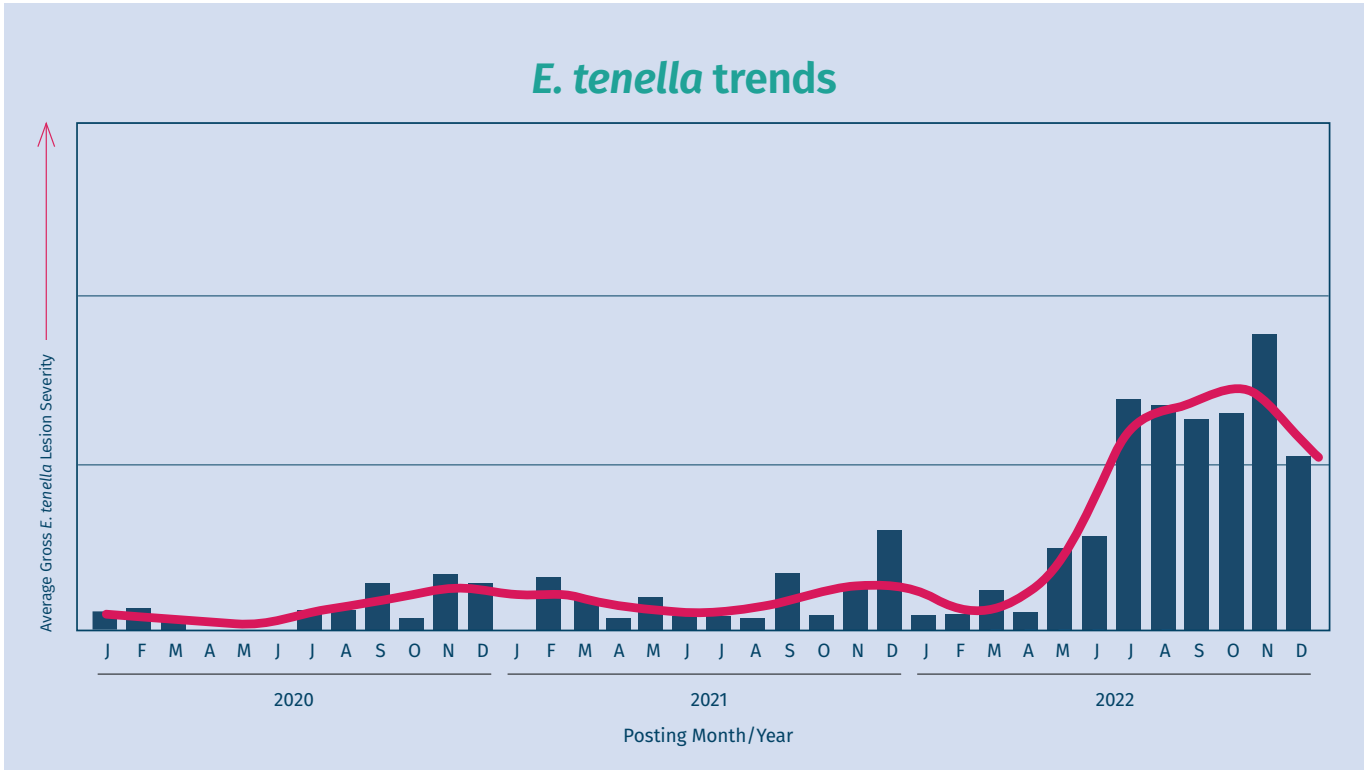
An unprecedented increase of *E. maxima* in 2022 saw more birds affected than in previous years. After a consistent level noted in spring and summer of 2021, fewer challenges were seen over the winter months. **A sharp increase due to more incidences in June, led to a peak in September.** Although the average reduced into the winter of 2022, levels remained higher than the same time in 2021.

Coccidiosis – E. tenella

The species most likely to cause mortality in the bird, clinical *E. tenella* is not often seen within the average broiler house. However, in 2022, **4.04% of birds presented gross *E. tenella* lesions**, a **five-fold increase** from 2021.



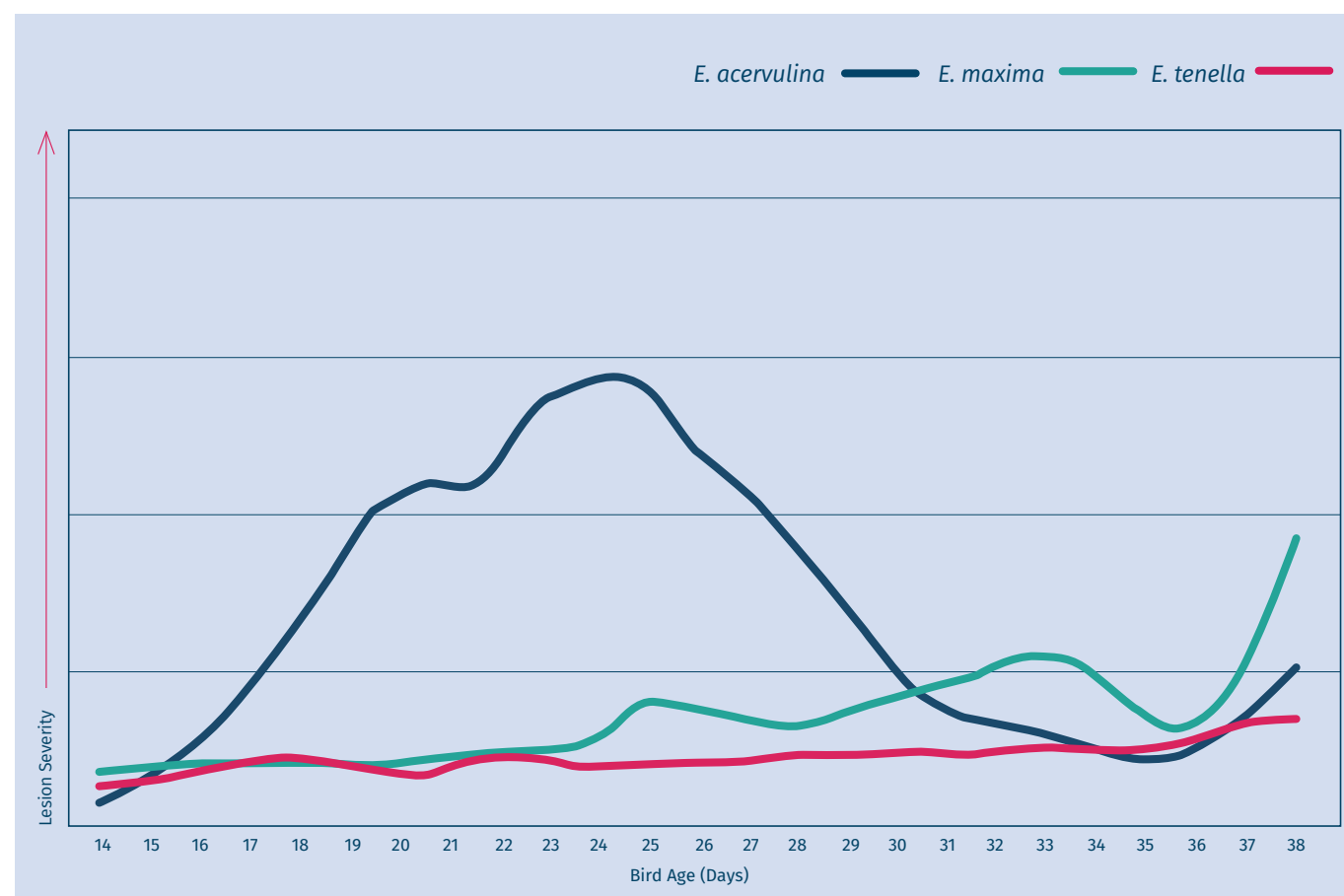
The increase was driven by a sharp increase in mild (score 1) *E. tenella* lesions.



In 2022, the levels of *E. tenella* recorded in HTSi were the highest the current HTSi team has seen. **There was a sharp increase from May and levels continued to rise until July**, where they remained consistent over the summer and autumn months. **November saw the highest levels**, before a reduction in December.

2022 Coccidiosis peaks

The graph below shows the age at which each species of coccidiosis is most prevalent.

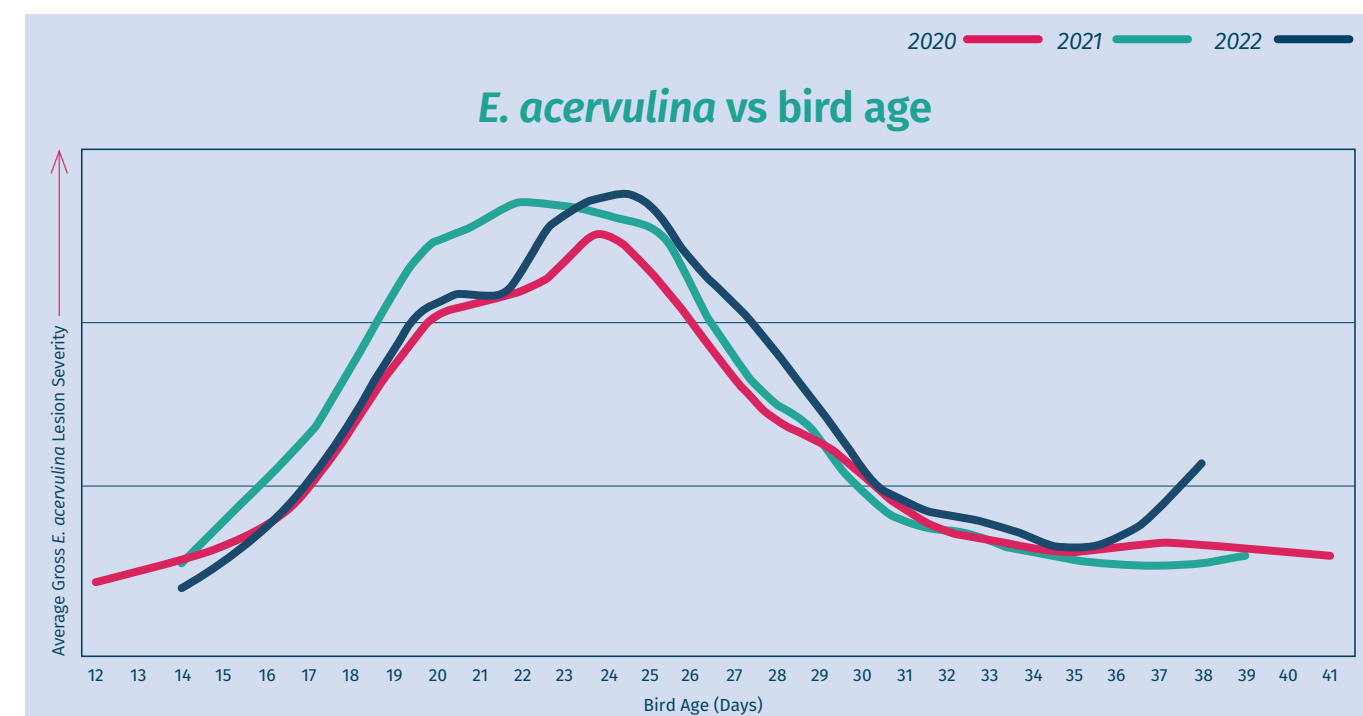


In 2022, *E. acervulina* peaked at 24 days, later than the 2021 peak of 22 days.

E. maxima can be seen from 22 days onwards, although most challenges are noted at 33 and then 38 days of age. In 2021, peaks were clear at 39 and 40 days of age, with minimal lesions noted in the late twenties.

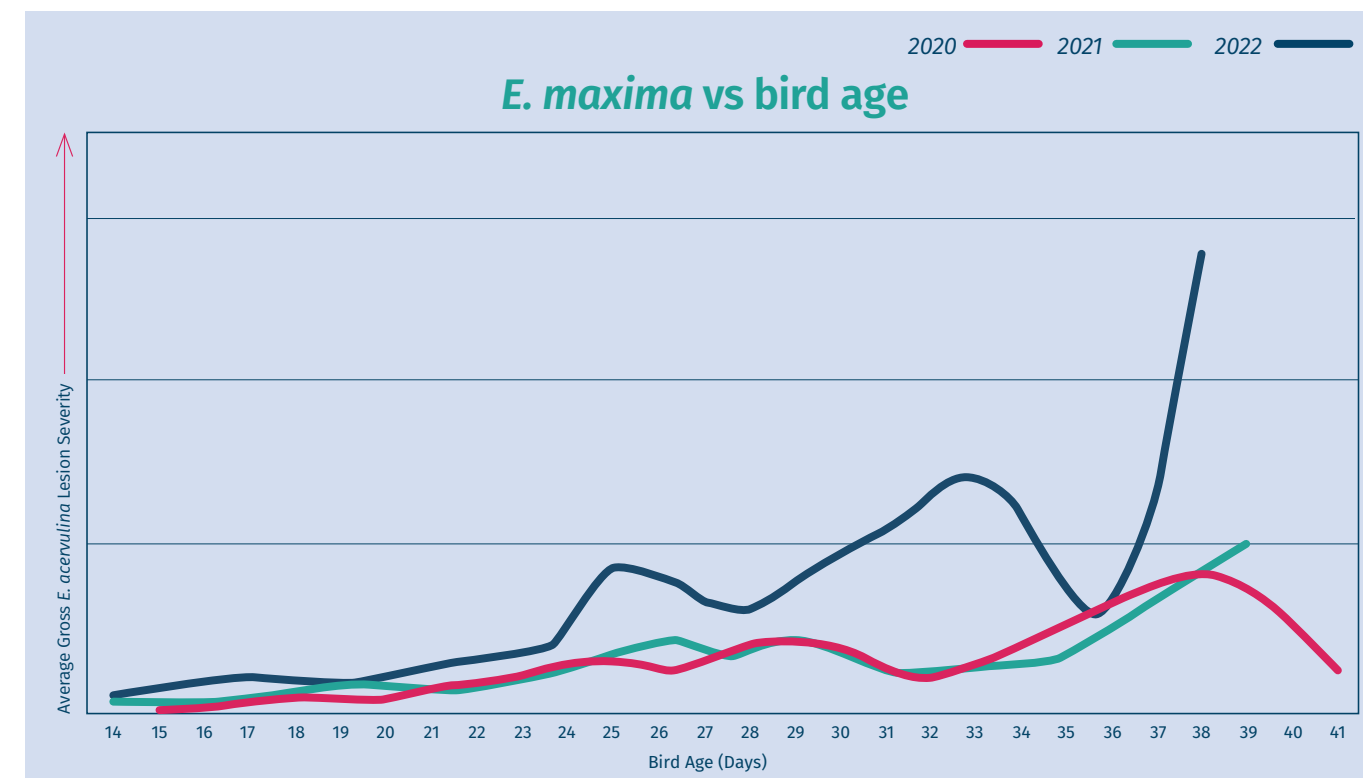
Incidences of *E. tenella* can be seen consistently from the early twenties onwards.

Coccidiosis challenge by year



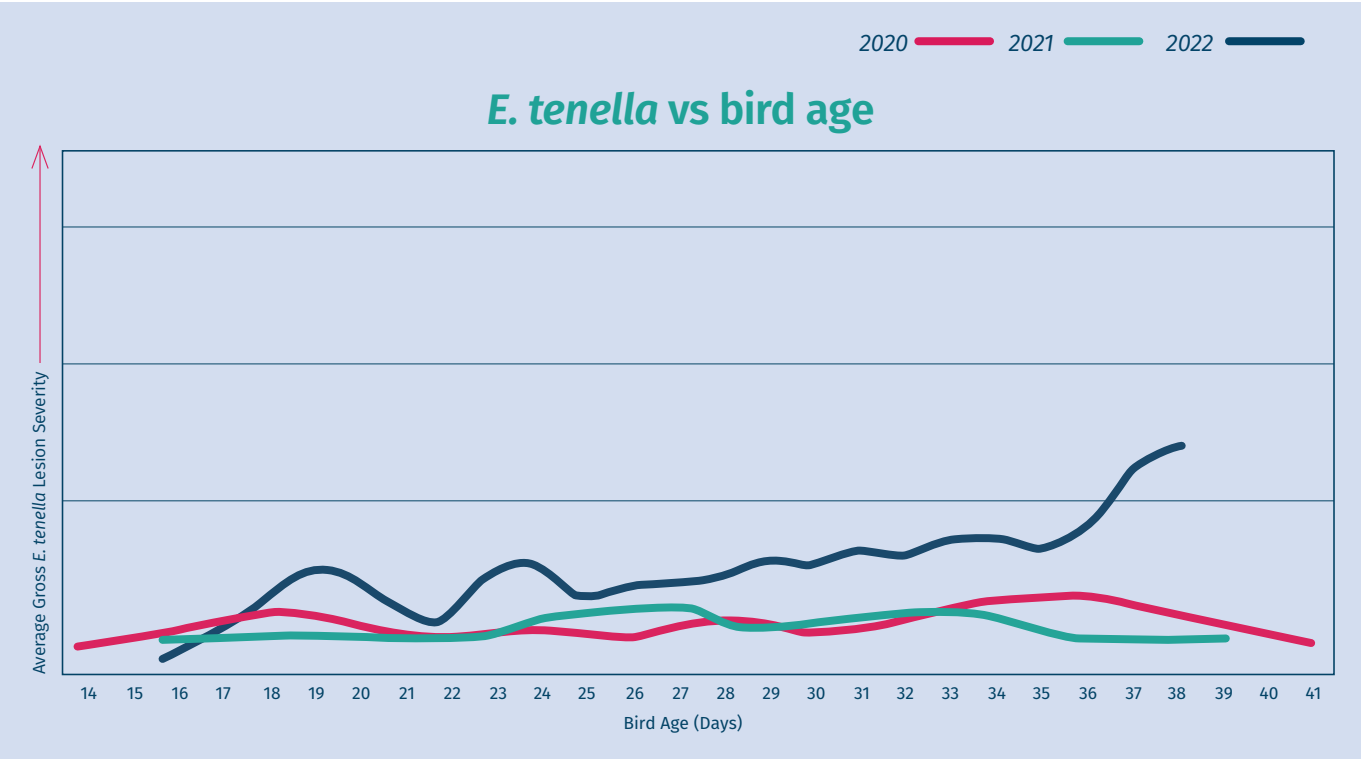
E. acervulina was most prominent at 24 days in 2022, the same as seen across industry in 2020. 2021 showed an earlier peak at 22 days.

In 2022, older birds from 36 days also showed mild (score 1) *E. acervulina* lesions, and although less birds at this age were seen, it is worth monitoring this to see how older challenges develop.



In 2022, *E. maxima* lesions were identified as early as 15 days, with challenges prominent at 25 and 33 days. Levels were highest in the oldest birds at 38 days, although no data beyond this age means outlooks in birds older than 38 days are minimal.

Coccidiosis challenge by year

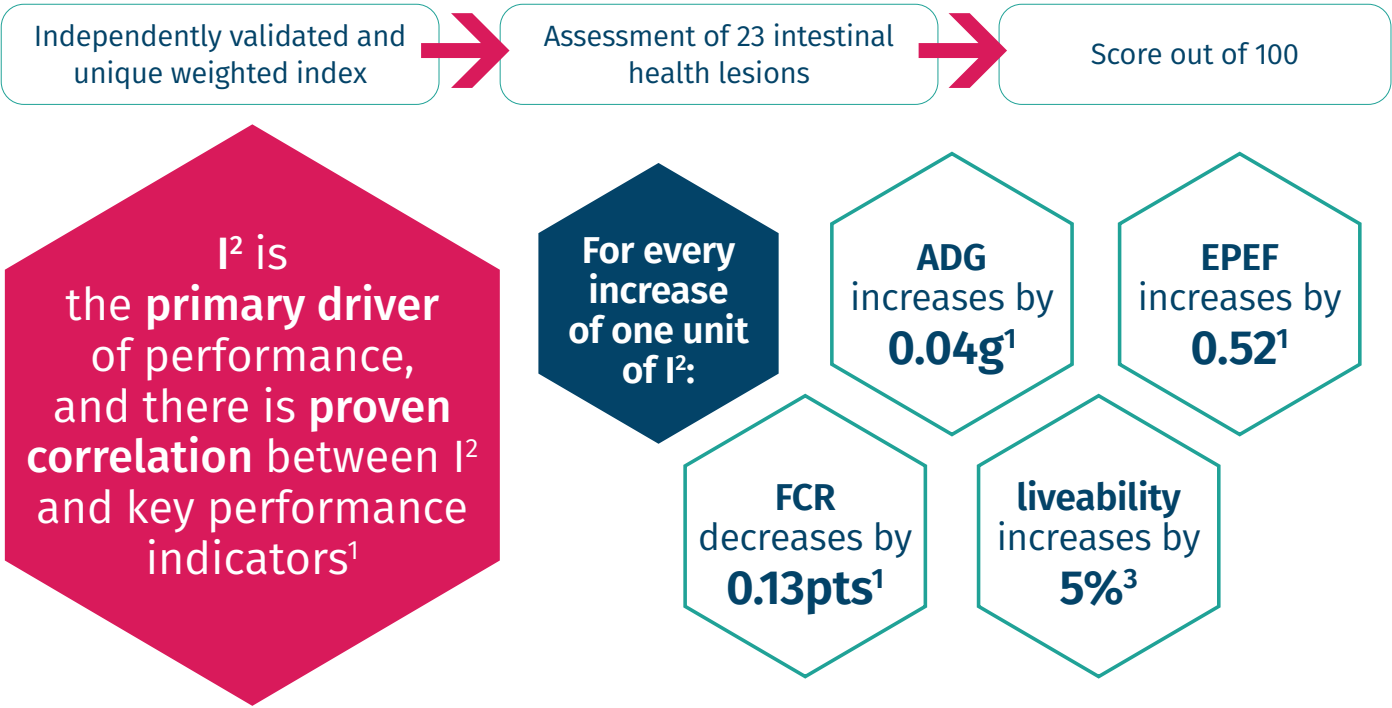


Incidences of *E. tenella* were noted as young as 16 days of age in 2022 and shows a positive trend as the bird age increases. Although there is no specific peak in 2022, most incidences seen were in older birds.

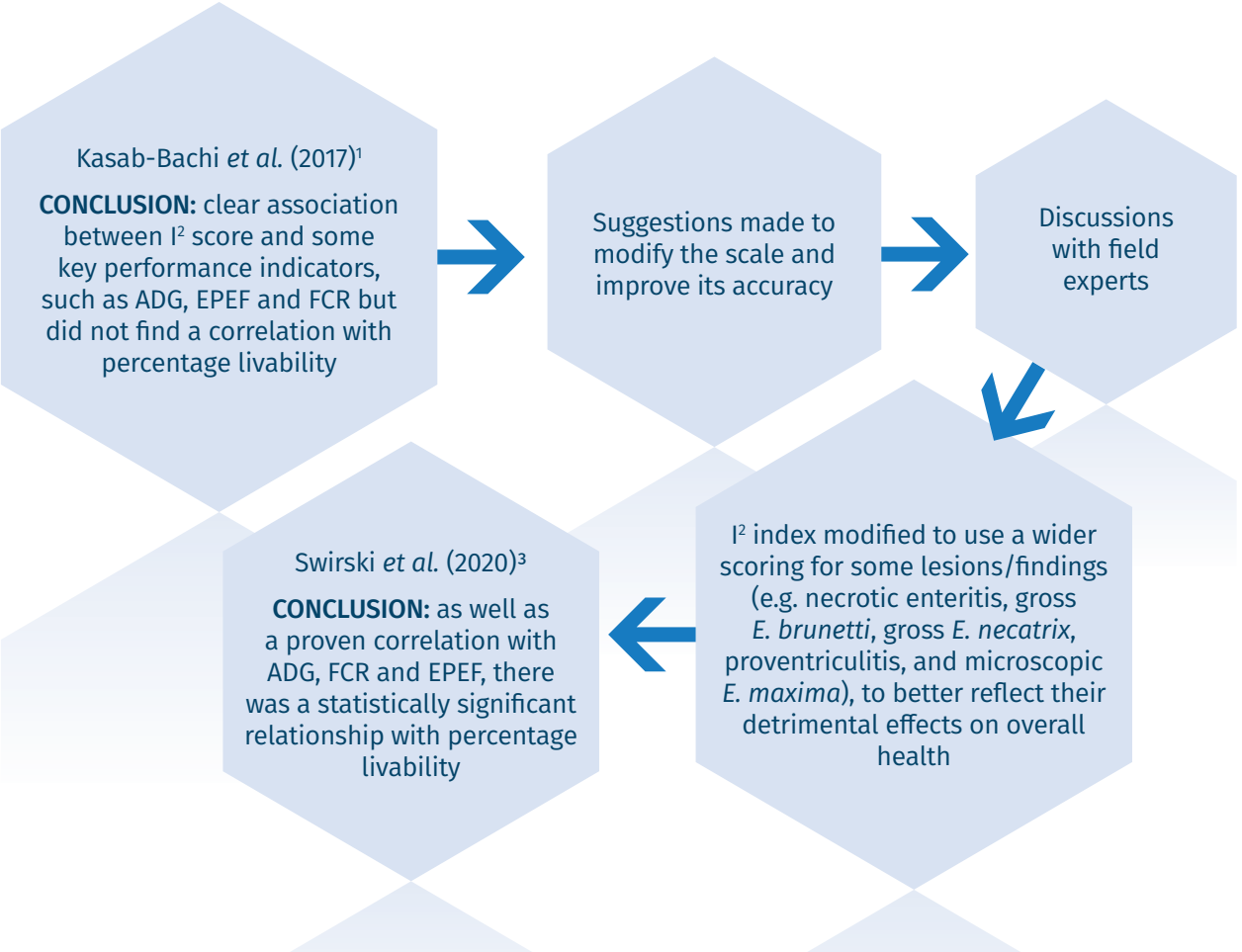


Intestinal Integrity (I²) index

The **independently validated** Intestinal Integrity index was developed to consistently and reliably assess intestinal health.



As part of **Elanco's commitment** to ensure that HTSi continues to **deliver the most valuable insight**, the system itself is subject to **continual improvement** processes.



Proven business benefits

For a poultry company producing 100 million broilers per year, partnering with Elanco to improve the I² index by 5 points could mean an annual income boost of

£614,900²

Healthier
intestinal
tract



More efficient
absorption
of dietary
nutrients



Decreased
feed costs



Reduction
in waste
excretion



How can we achieve this?

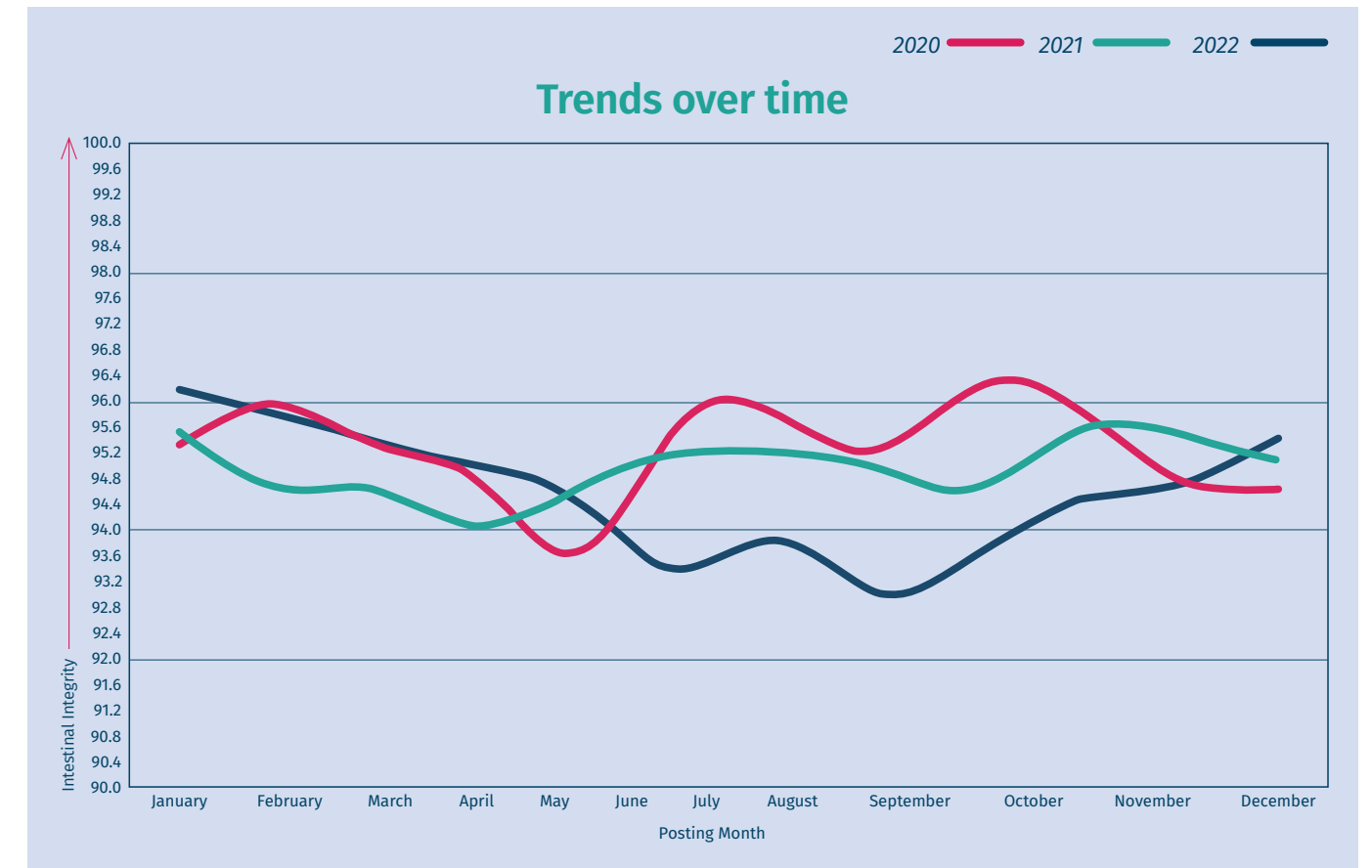
By understanding the current challenges and seasonal trends, allowing proactive intervention to reduce potential losses.

Identifying the opportunities to improve ADG, FCR, EPEF and percent livability.^{1,3}

The I² index, combined with information contained in the HTSi database, could be used to identify the yield gaps in production and suggest possible interventions to close these gaps.

Alexandra L. Swirski et al., Novometrix Research Inc.

Intestinal Integrity



In 2021, the Intestinal Integrity of the UK flock was generally stable. I² declined slightly over spring, before improving over summer with a further increase towards winter. In 2022, there was more variation and instability. The I² index started to follow a similar trend, declining in the spring. However, this then continued to decrease with the lowest I² average noted in June and August. Since then, I² gradually increased over winter, with averages slowly reaching similar levels to 2021.



Maxiban delivers stable and continuous coccidiosis control... effortlessly.



Using Maxiban™ in combination with Monteban™ to control coccidiosis provides stability and is a simple approach compared to the risks when changing anticoccidial programmes.

A Maxiban & Monteban programme has the potential to deliver:

- Stable coccidial population control - trusted for over 20 years
- £1.71M return on investment⁴
- FCR improvement of 5.46 points⁴.

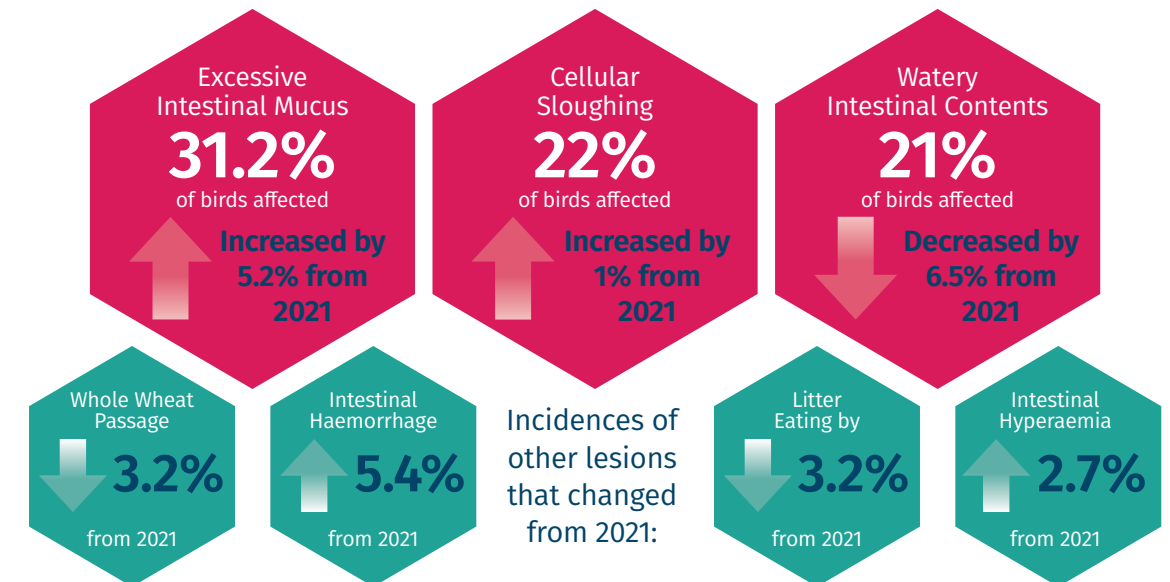
Stability you can count on



Intestinal Integrity

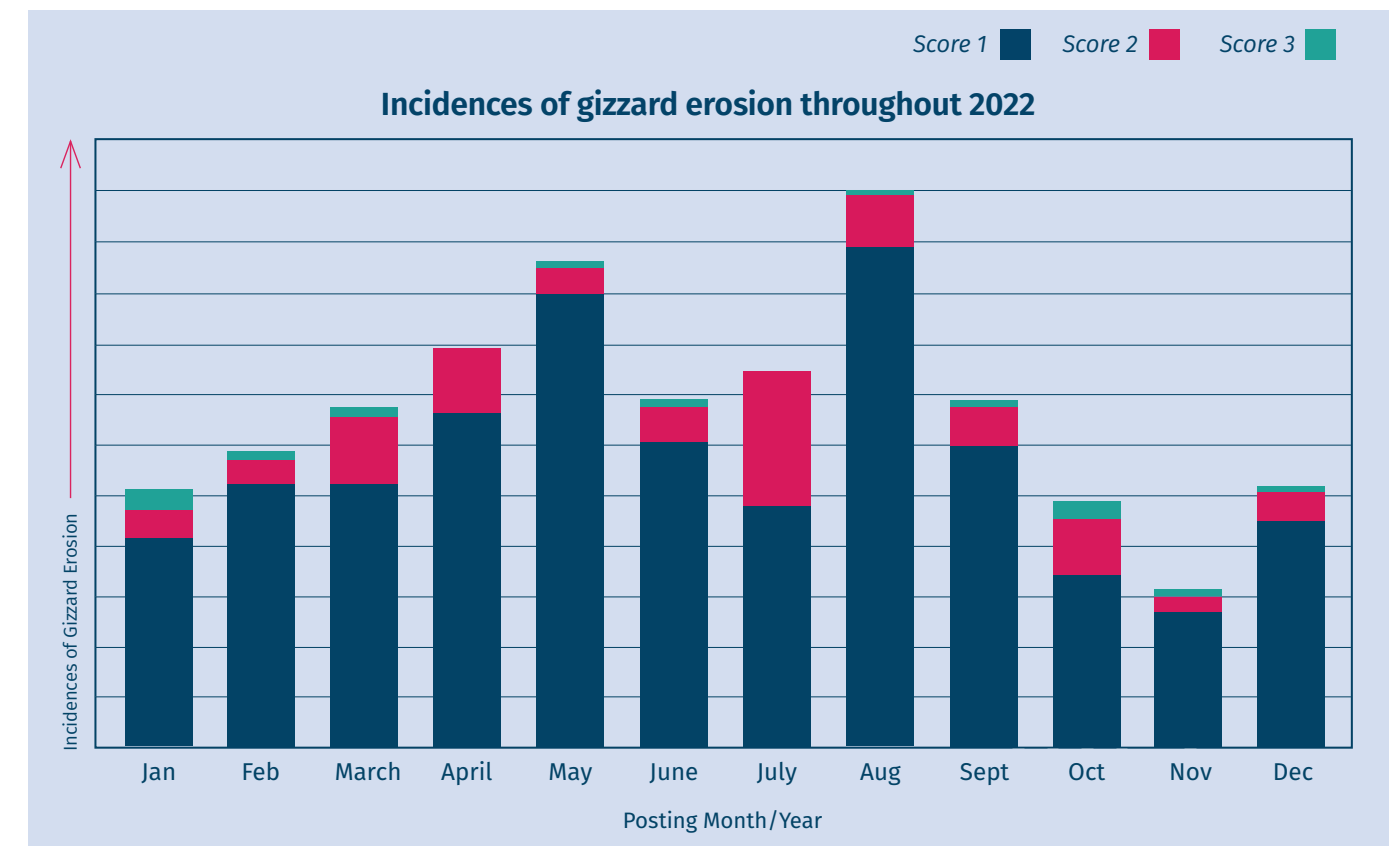
Key Lesions

Aside from *E. acervulina* that affected **40.1%** of birds, the top three occurring intestinal health lesions in 2022 were:



Gizzard Health

There has been little variation in incidences of **gizzard erosion** over the past three years, with 21% of birds affected in 2022, and 22% affected in both 2021 and 2020.



Like 2021, incidences of gizzard erosion rose in spring until May. Levels then decreased again over the year, with exception to August where a peak was noted.

WANT TO ACHIEVE STABLE & CONTINUOUS COCCIDIOSIS CONTROL?

Using Maxiban™ in combination with Monteban™ provides...

Reduced complexities

Low labour requirements
Stable coccidial population control

Consistent performance improvements that last

FCR improvements of 5.46⁴
Stable Intestinal Integrity (I²) scores⁵
20 years of successful coccidiosis control for poultry producers worldwide

The development of acquired immunity

Adding another layer of protection



CHOOSE THE TRUSTED SOLUTION THAT DELIVERS STABLE AND CONTINUOUS COCCIDIOSIS CONTROL



Narasin + Nicarbazine



Narasin

Has the potential to deliver a £1.71M return on investment⁴

Narasin is **significantly more effective** at reducing intestinal lesions than monensin, when administered at the same dose rate⁶
Unlike other ionophores, narasin has a **positive effect** on feed intake, growth and FCR²⁻⁹

Maxiban™ has been shown to outperform a similar monensin/nicarbazin programme¹⁰
5.7% more feed efficiency
7.5% more growth
1.7% more breast meat

Using Maxiban™ for at least another 7 days past the peak coccidial challenge **improves FCR by up to 0.23 per day** of extension outperforming all other ionophore programmes¹¹

Use MAXIBAN™ in combination with MONTEBAN™ for stable coccidiosis population control
Consistently trusted by poultry producers to protect against the effects of coccidiosis for over 20 years



Locomotor Health

Leg Health

Lesions associated with leg health have remained similar to 2021.

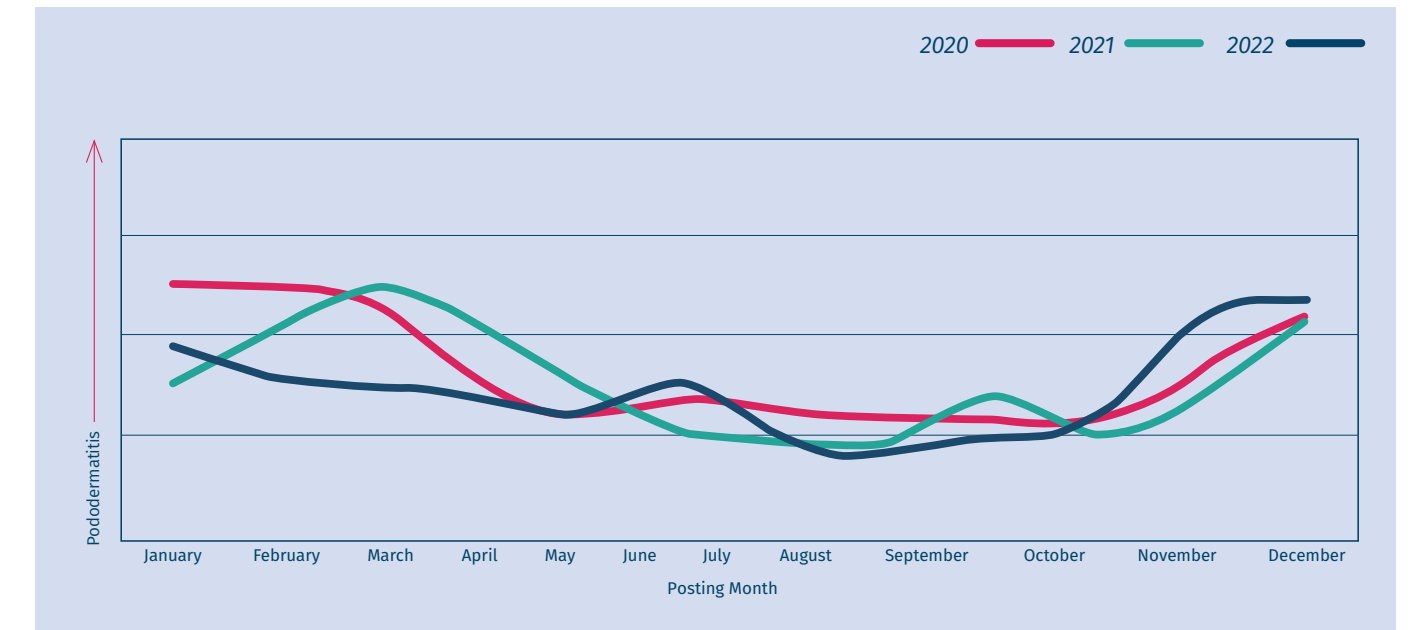
22.96%
of birds had detached cartilage, similar to 22.43% in 2021

6.7%
Tibial dyschondroplasia, affected 6.7% of birds, 2.1% were moderate to severe

0.9%
Femoral head necrosis at 0.9%.

Pododermatitis

Incidences of pododermatitis have continued to decrease since 2019, with 22.7% of birds affected in 2022. From those affected with pododermatitis, severe (score 2) lesions made up 22.6%. As expected with cooler weather affecting wet litter, levels were highest in November and December.



Ionophores and sustainability

Used since the 1970's, ionophores are still an effective and efficient tool to improve Intestinal Integrity, and evidence of resistance to these compounds is virtually non-existent. Ionophores are classified as **antimicrobials** and have a wide-spectrum effect against several micro-organisms, however, they are not used in human medicine and there is currently no scientifically proven association between bacterial resistance and ionophores.

ECONOMIC

Poor coccidiosis control has a negative economic impact, due to **INCREASES** in:

FCR
Feed costs
Mortality

Days to slaughter

It also prevents more birds being placed per square metre^{12,13}

ENVIRONMENTAL

Good coccidiosis management saves up to

6% feed
6% water
6% space

At EU levels, this the equivalent to the carbon footprint of 14 cars/year¹⁴

SOCIAL

Effective coccidiosis management results in:

Reduction in secondary diseases including necrotic enteritis due to overgrowth of Clostridium Perfringens¹⁷

Better bird welfare; less breast blister and dry litter¹⁶

Less zoonotic diseases^{18,15}

A reduction in antibiotic usage^{15,16}

Good coccidiosis management can reduce antibiotic usage by up to

5x^{15,16}

The impact of poor coccidiosis control costs approximately

£10.5 BILLION

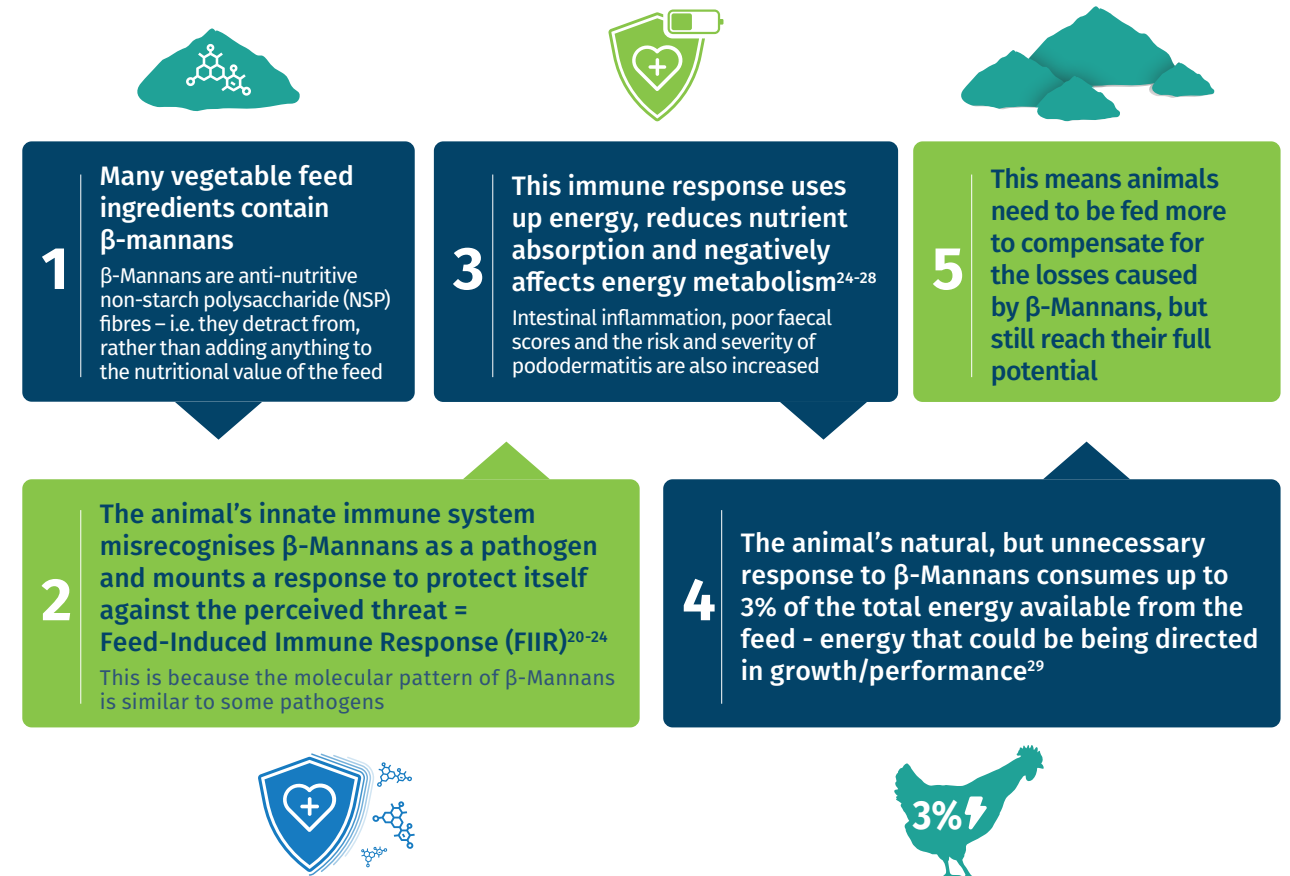
per annum worldwide¹⁹



Hemicell™ XT

Hemicell XT stops you feeding the problem of β -mannans.

How do β -Mannans cause production losses?



How does Hemicell XT prevent production losses?



Hemicell XT uses patented enzymatic action to break down β -Mannans, preventing FIIR^{29,30}. This frees up energy for growth and production, maintaining performance on reduced feed costs.

Not all enzymes are made equal...

Some enzyme products work by reducing fibre viscosity and improving performance via rate of passage through the gut.

Others improve nutrient digestibility by "opening up" feed components the animal is unable to access on its own. These are considered energy-releasing enzymes.

Hemicell XT is different because it is an **energy sparing enzyme**. Rather than trying to find extra energy, it stops unnecessary, energy sapping processes taking place, so that everything available from the feed can be fully directed towards essential body processes, growth and production.

Hemicell XT vital statistics:

- > Patented enzyme = Endo-1,4- β -mannanase
- > Produced by *Paenibacillus lentus*
- > Heat tolerance to pelleting temperatures of 190°F/88°C for 60 seconds
- > Approved for use in poultry (broilers and turkeys) and swine diets in most major markets

Guaranteed analysis

Hemicell XT is a patented enzyme product with guaranteed potency to ensure sufficient β -Mannanase activity in the final feed to prevent FIIR:

- > Hemicell XT* (dry) β -Mannanase (EC 3.2.1.78) (from *Paenibacillus lentus*), not less than 360 MU/kg.

* One unit of β -mannanase activity is defined as the amount of enzyme which generates 0.72 microgram of reducing sugars per minute from a mannose containing substrate at pH 7.0 and temperature of 104°F.

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Veterinary comments

From James Bishop BVM BVS MRCVS –
Poultry Technical Consultant, Elanco.



Between January and December 2022, the poultry industry faced further unprecedented times. Following on from the Covid-19 Pandemic, restrictions were lifted, but Russia's invasion of Ukraine triggered new levels of inflation, with prices of both energy and raw materials soaring. The impacts of this, alongside one of the most turbulent years for UK politics, had major impacts on the UK poultry sector.

For the UK broiler sector, struggles such as labour shortages, raw material costs, energy prices and Avian Influenza have all caused further headache beyond the normal production concerns. When evaluating Intestinal Integrity (I²) for 2022, the year started with strong integrity across the UK industry. However, over the summer months, stability within the UK was lost as demonstrated by the fall in I² compared to previous summers. From June to September 2022, the average Intestinal Integrity score in UK was 93.4, 1.6 points less than the same period in 2021. Globally, HTSi data which includes 54 countries, showed an average Intestinal Integrity score of 95.3 in the same four months.

I² increased leading into winter, where intestinal health started to improve. However, the turbulence of summer was still having an impact, especially on pododermatitis, where wet litter has hugely contributed to the highest levels of pododermatitis we have seen recently for the time of year. It is without a doubt, that increased levels of coccidiosis and lower I² have resulted in wetter litter and rising pododermatitis.

The most significant challenge we saw last year that contributed to lowering I², was the elevated levels of *E. maxima* seen during the summer months. As shown in the graph on page 8, June through to September 2022 saw a huge increase in *E. maxima* levels compared to previous summers, with 18% of birds presenting with gross and microscopic *E. maxima* lesions in this time, compared to 5% in the same period in 2021. As a basis for comparison, *E. maxima* was present in 10% and 15% of the birds evaluated globally and in the EMEA (Europe, Middle East and Africa) region in this period, respectively. The loss of stability in controlling this damaging species of coccidiosis has without question, had a marked impact on the lowering of I² which was seen last year. Such substantial numbers of *E. maxima* lesions hampers FCR, ADG and EPEF^{30,31,32}, which, considering the financial challenges, has likely had great impacts on the economics surrounding broiler production. Another fact that cannot be overlooked is that *E. maxima* is a predisposing factor for Necrotic Enteritis, a disease that, even in a subclinical form, impacts animal welfare and production sustainability^{33, 34}.

In addition, the latter stages of summer also saw a five-fold increase in levels of *E. tenella* seen during post-mortem examinations. *E. tenella* is the coccidia species most likely to cause an increase in mortality and is a species that we do not often see in high levels in the UK. The loss of stability within the UK broiler industry in 2022 enabled these levels to rise, often leading to an increased level of medical intervention.

Thus, in the face of several external factors impacting the margins of poultry production, assertive and constantly applied measures are even more relevant to ensure the stability of Intestinal Integrity and, consequently, performance in the long term. Acting on what is controllable, not neglecting management and biosecurity measures, using reliable resources, and continuing to closely monitor the field, are some measures that will help us to have peace of mind to face the next challenges and, indeed, opportunities, of this dynamic and exciting industry.

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For further information or queries on
anything in the Elanco Annual Report,
please contact Louise and the Elanco team.

Louise Ashworth, HTSi Technical Consultant
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