



## Control the Impact of *E. maxima* on Flock Performance

Coccidiosis in broilers has long been known to adversely effect weight gains and feed conversions. *Eimeria maxima* presents the greatest danger to broiler performance, even when this coccidial species is at subclinical levels. The *E. maxima* life cycle invades deeply into the intestinal villi, disrupting blood flow to the absorptive surface cells. A single *E. maxima* schizont can disrupt the flow of nutrients to large sections of surface cells. Other coccidial species, such as *E. acervulina*, only attack surface cells. Thus, a heavier infection is required to impact much of the absorptive capacity of the villi.

### Key Points

- ➔ Use chemical anticoccidial programs *where effective, and only for 1 to 2 cycles to avoid performance loss through resistance.*
- ➔ Use ionophore anticoccidial programs only where *Eimeria* strains are sensitive, since the leakage that does occur will cause late damage with significant impact on feed conversion.
- ➔ Use vaccination with Coccivac®-B vaccine to induce immunity through early exposure to *E. maxima*, with recovery and compensatory gain. The vaccine oocysts populate the premises with anticoccidial sensitive strains, improving the efficacy of both ionophore and chemical anticoccidials for future use.

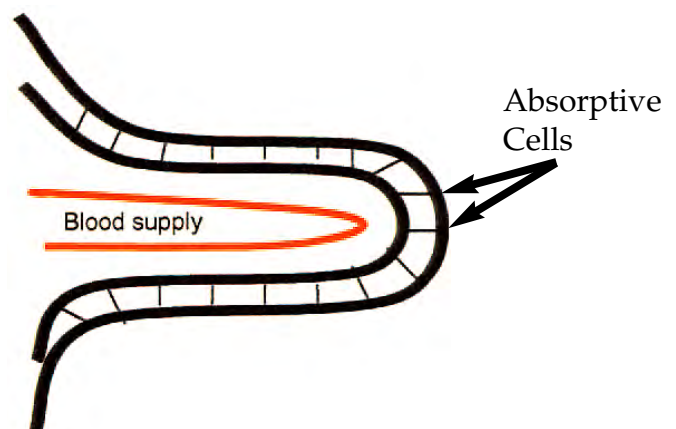
### Anatomy of Feed Conversion



Cross-section of intestine

The absorptive surface of the intestine is increased by finger-like projections called "villi".

Each villus is composed of an outer layer of absorptive cells over a substrate which provides the blood supply and nutrients to the surface cells.



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## Impact of Coccidiosis on Nutrient Absorption

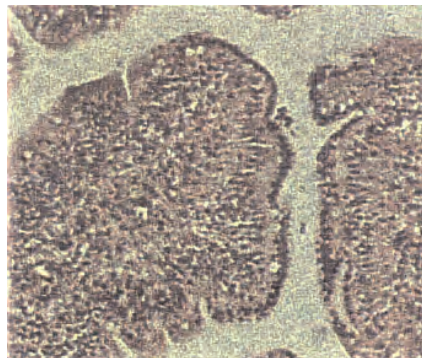
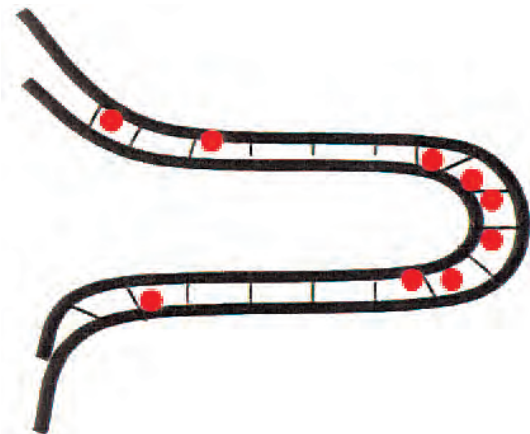


Photo courtesy of Tom Brown,  
University of Georgia

*Eimeria acervulina* attacks the absorptive surface cells. Large numbers of cells must be disrupted by *E. acervulina* before significant absorption is lost.

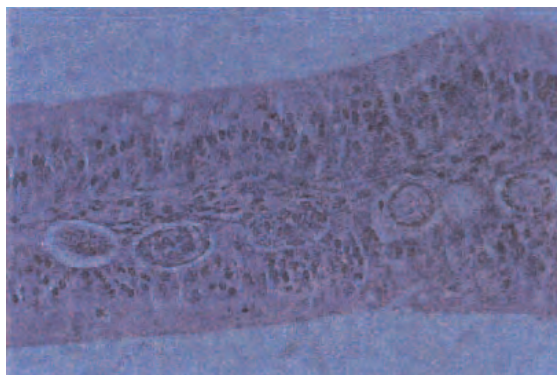
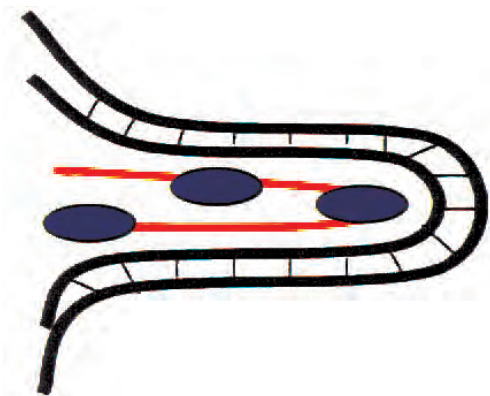


Photo courtesy of Tom Brown,  
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*Eimeria maxima* attacks the deeper substrate areas of the villi. A single large *E. maxima* schizont can disrupt the nutrient flow to large groups of surface cells. **Minor *E. maxima* infections can result in very significant loss of weight gain and/or feed conversion.**

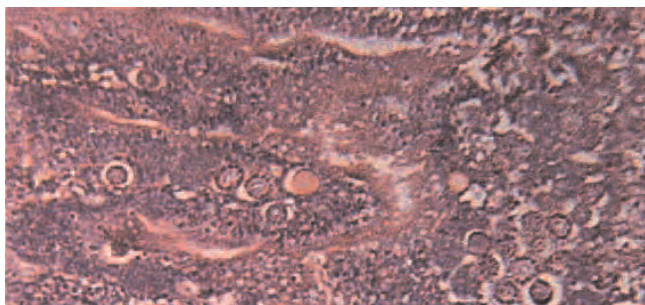


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The surface cells on these villi have died, resulting in a "fuzzy" villus appearance. The dead cells are sloughing, resulting in the debris to the right of the photo.

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## Control of *E. maxima* Infection is Critical to Performance

- **Maximum performance results from complete control of *E. maxima*.**
- **Where complete control is impossible, *early exposure* and immunity-building are the keys to recovery and compensator gain to maximize performance.**

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## Coccidiosis Control Programs

- Chemical anticoccidials achieve complete control of *E. maxima* where field coccidial populations have minimal resistance. These programs will provide the maximum potential flock performance, but sensitivity is short-lived.
- Ionophore anticoccidials allow *E. maxima* leakage. Performance can approach that of chemical anticoccidials if the field coccidial populations are sufficiently sensitive. As resistance builds, the *E. maxima* impact on the intestine increases, usually peaking at 28 days of age. This late exposure to *E. maxima* damage will adversely impact performance.
- Vaccination with Coccivac®-B vaccine at day-of-age via spray cabinet promotes early, mild and controlled *E. maxima* exposure and development of immunity. The *E. maxima* impact on the intestine occurs at 14 – 21 days of age, allowing time for intestinal recovery and compensatory gain and performance. Vaccination can be used in broilers processed as young as 40 days with performance similar to effective ionophore programs.
- The *Eimeria spp.* oocysts in Coccivac-B vaccine are sensitive to all currently available anticoccidials. This unique feature can be incorporated into a long-term coccidiosis control program by repopulating poultry houses with sensitive oocysts on an annual basis.

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