DSM

Hy•D®

The poultry industry understands 25-OH D3

- It's well understood…
- Vitamin D_3 is required for the normal absorption and metabolism of calcium and phosphorus.
  - Skeletal development
  - Helps avoid rickets in young growing chickens
  - Helps avoid poor eggshell quality in laying hens
- Vitamin D_3 helps support immune health
- 25-OH D3 is the fastest, most efficient way to get Vitamin D_3

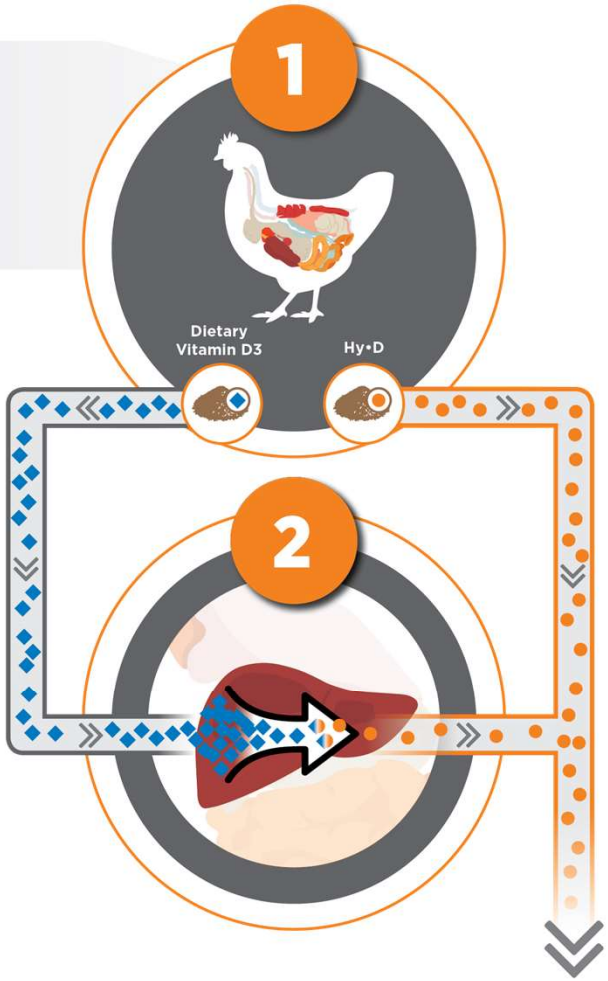
The NUMBERS don't lie!

DSM

Hy•D®

Unique Mode of Action for Faster, More Efficient Absorption

Metabolizing vitamin D more efficiently — Hy•D is a pure and proprietary vitamin D3 metabolite called 25-OH D3, the circulating form of D3. All the benefits associated with vitamin D3 are obtained faster and maintained longer by adding Hy•D.



The Liver —
When vitamin D is fed, it must travel to the liver in order to be converted to 25-OH D3. The liver can act as a "bottleneck" and inhibit the efficient conversion of D3.

Hy•D Bypasses the Liver —
Alternatively, when Hy•D is fed it bypasses the animal's liver to ensure direct availability of 25-OH D3, the circulating form of vitamin D3.

The NUMBERS don't lie!

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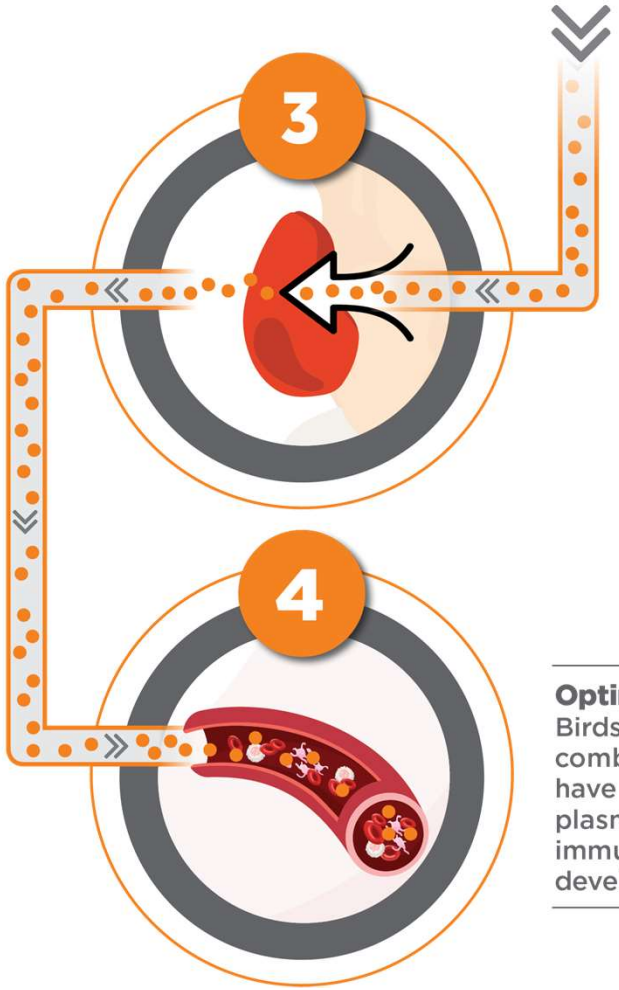
Hy•D®

The Kidney —
Once 25-OH D3 reaches the kidneys and other target tissues, it is further hydroxylated into the active form of vitamin D called 1,25-OH2 D3, which allows the body to utilize and absorb dietary calcium and phosphorus.



Optimal Vitamin D Status —
Birds supplemented with Hy•D in combination with vitamin D3 consistently have higher circulating levels in blood plasma, which supports a healthier immune system and improves skeletal development and bone health.

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Hy•D impact on breast meat yield

Hy•D impact on broiler breast meat yield*
2018 North America Industry Statistical Report

Bird size	Bird weights	Breast meat yield Hy•D improvement vs. No 25-OH D3
SMALL birds	3.6 to 4.4 lb	+ 0.6%
MEDIUM birds	4.4 to 5.2 lb	+ 2.0%
MEDIUM birds	5.2 to 6.0 lb[1]	- 0.35%
MEDIUM birds	6.0 to 6.8 lb[1]	+ 0.8%
MEDIUM birds	6.8 to 7.5 lb	+ 1.4%
Average of small & medium birds		+ 0.89

[1]Based on feeding Hy•D beyond starter
*Based on Agri Stats (2018) review of Hy•D usage

Hy•D showed a consistent improvement in breast meat yield compared to No 25-OH D3 across all groups

The NUMBERS don't lie!

Hy•D supports immune function (an example)

Immune modulation

Challenge model

- Injection of LPS (lipopolysaccharides) to cause inflammatory responses in broiler chickens

Objective

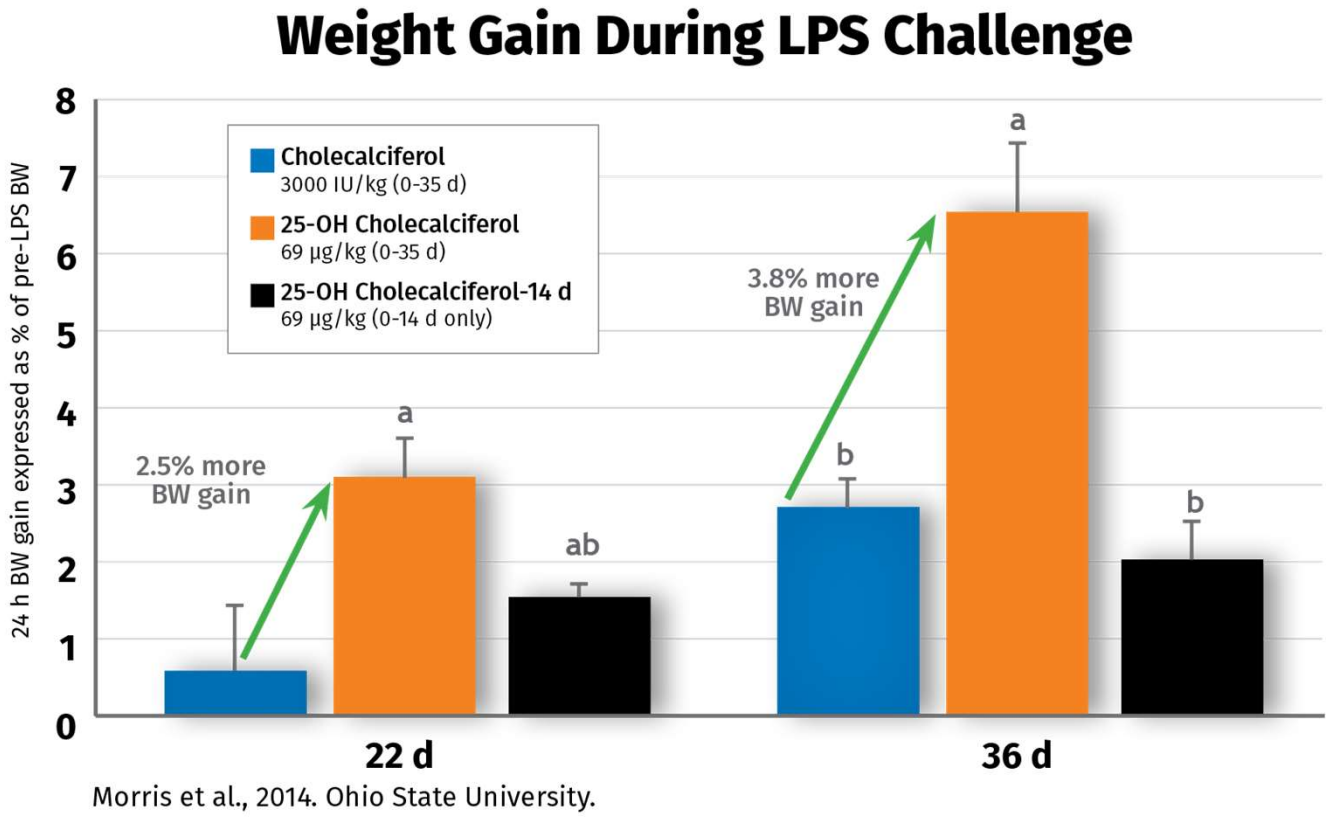
- To evaluate Hy•D effects in suppressing these responses

Results

- Hy•D improved weight gain compared to D3 post LPS challenges
  - Exerted anti-inflammatory effects
  - Beneficial during immune challenges
  - Beyond starter supplementation maintained the effects
  - Starter only supplementation did not

Morris et al., 2014. Ohio State university

Hy•D immune modulation trial results



Morris et al., 2014. Ohio State University.

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