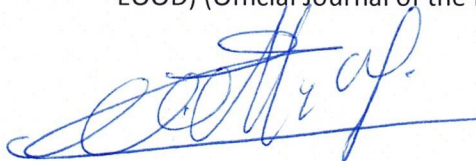


Antwerp November 3rd 2021

**Information on the use of research results carried out
in cooperation with the Department of Poultry Science,
Faculty of Animal Bioengineering, University of Warmia and Mazury in Olsztyn**

Huvepharma EOOD informs that in the period 2017-2019, prof. Krzysztof Kozłowski and colleagues from the Department of Poultry Science, Faculty of Animal Bioengineering, University of Warmia and Mazury in Olsztyn, conducted research studies on the efficacy of the innovative feed enzyme 6-phytase (OptiPhos® PLUS) in poultry feeding (broiler chickens, laying hens, turkeys). A wider publication of the results of these studies has so far been impossible due to the commercialization process of 6-phytase (OptiPhos® PLUS) as an innovative market product. However, they were used by Huvepharma EOOD, among others, for:

1. elaboration of Technical Bulletins (containing short descriptions of experiments and the obtained results, as well as research conclusions), which were and are distributed by the company's employees among poultry and feed producers as informational and promotional materials:
 - OptiPhos® Plus G improves performance, bone ash and ileal digestibility of phytate, phosphorus and protein in a dose-responsive way. Technical Bulletin 2. OptiPhosPlus.TB02.EN02.0520/GI;
 - OptiPhos® Plus G already improves turkey performance at 250 FTU/kg. Technical Bulletin 6. OptiPhosPlus.Poultry.TB06.EN02.0520/GI;
 - OptiPhos® Plus G outcompetes OptiPhos® CT in broilers at 500 and 1000 FTU/kg. Technical Bulletin 7. TB.OptiPhosPlus.Poultry7.EN02.0220/GI),
2. preparing of documentation necessary in the process of obtaining permission, issued by relevant institutions, for the introduction of 6-phytase (OptiPhos® PLUS) on the market:
 - Scientific opinion of European Food Safety Authority (EFSA). Safety and efficacy of OptiPhos® Plus for poultry species for fattening, minor poultry species reared for breeding and ornamental birds. EFSA Journal 2020;18(6):6141 <https://doi.org/10.2903/j.efsa.2020.6141>,
 - Scientific opinion of European Food Safety Authority (EFSA). Safety and efficacy of OptiPhos® PLUS (6 phytase) for laying hens, turkeys for breeding, chickens for breeding, minor poultry species for egg production purposes and breeding. EFSA Journal 2020;18(6):6161. <https://doi.org/10.2903/j.efsa.2020.6161>,
 - Commission Implementing Regulation (EU) 2020/2121 of 16 December 2020 concerning the authorisation of a preparation of 6-phytase produced by *Komagataella phaffii* DSM 32854 as a feed additive for all poultry species, ornamental birds, piglets, pigs for fattening, sows and minor porcine species for fattening or reproduction (holder of authorisation: Huvepharma EOOD) (Official Journal of the European Union, L 426/28, 17 December 2020).



Lode Nollet, MSc., PhD

Global Product Manager Enzymes



OptiPhos® Plus G already improves turkey performance at 250 FTU/kg

Trial description

1 Set-up

- **Location:** University of Warmia and Mazury, Poland
- **Trial period:** February – May 2018
- **Animals:** 540 Hybrid Converter females distributed over 30 pens of 18 birds each.
- **Feeds** (Table 1; pelleted, corn/soy based):
 - Starter feed (d 0-7) was without added phytases and was fed to all treatments (12 g/kg Ca and 6.0 g/kg aP).
 - Grower 1 feed (day 8-28):
 - o Positive control containing 12 g/kg Ca and 6.0 g/kg aP
 - o Negative control containing 11 g/kg Ca and 4.5 g/kg aP
 - Grower 2 feed (day 29-56):
 - o Positive control containing 10.0 g/kg Ca and 5.0 g/kg aP
 - o Negative control containing 9.0 g/kg Ca and 3.5 g/kg aP
 - Finisher feed (day 56-84):
 - o Positive control containing 8.5 g/kg Ca and 4.3 g/kg aP
 - o Negative control containing 7.5 g/kg Ca and 2.8 g/kg aP

2 Treatments (only grower and finisher)

- Positive control
- Negative control
- Negative control + OptiPhos® Plus G at 250 FTU/kg

3 Measurements

- Technical result: growth, feed intake and feed conversion.
- Day 40-44: total tract digestibility was determined by collecting excreta for determination of digestibility of dry matter, ash, Ca and P.
- At day 44: per pen 2 birds with average body weight were selected of which the right tibia were removed and pooled to one sample to determine bone ash.

Results

- OptiPhos® Plus G added at 250 FTU/kg to the negative control brought final body weight and feed conversion back to the positive control (Fig. 1).
- OptiPhos® Plus G increased significantly the dry matter digestibility vs the negative control (Table 2).
- Ca and P digestibility were improved significantly by adding OptiPhos® Plus G even exceeding the positive control value.
- Based on the bone ash results and the dig. P value measured, it could be calculated that 250 OptiPhos® Plus G equals 0.78 g aP and 0.67 g dig. P (as MCP) respectively.

Table 1. Feed composition and analysis

Feed material	Starter (d 1-7)	Grower 1 (d 8-28)		Grower 2 (d 29-56)		Finisher (d 57-84)	
		PC	NC	PC	NC	PC	NC
Corn	46.4	46.4	47.6	46.0	47.3	50.3	51.6
Soybean meal	39.4	39.4	39.2	38.4	38.2	30.6	30.4
Rapeseed meal	5.0	5.0	5.0	7.0	7.0	10.0	10.0
Potato protein	3.0	3.0	3.0	0.0	0.0	0.0	0.0
Soybean oil	1.2	1.2	0.8	3.8	3.4	3.0	2.6
Animal fat (lard)	0	0	0	0	0	2.5	2.5
Limestone	1.6	1.6	1.6	1.2	1.3	1.0	1.1
MCP	2.2	2.2	1.5	1.7	1.0	1.4	0.7
Others*	1.3	1.3	1.3	1.9	1.9	1.1	1.1
Nutritional composition (g/kg)							
Crude protein	270	270	270	250	250	225	225
Lysine	18.0	18.0	18.0	16.2	16.2	14.0	14.0
Calcium	12.0	12.0	11.0	10.0	9.0	8.5	7.5
Total Phosphorus	9.4	9.4	7.9	8.5	7.0	7.7	6.2
Av. Phosphorus	6.0	6.0	4.5	5.0	3.5	4.3	2.8
ME (kcal/kg)	2750	2750	2750	2900	2900	3030	3030

* Salt, Sodiumsulphate, Choline Chloride, Synthetic Amino Acids and vitamin/mineral premix

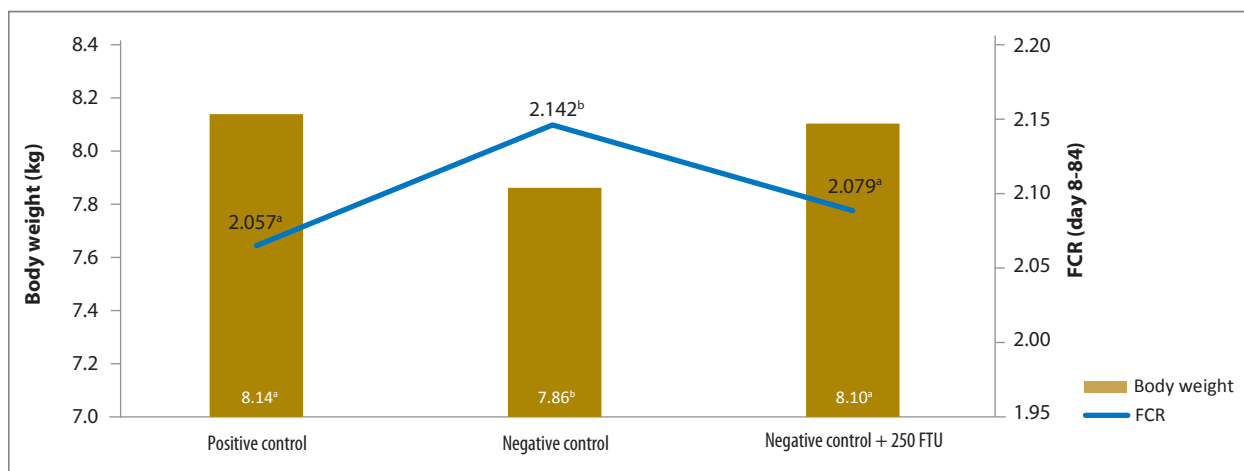


Fig. 1. Effect on body weight and feed conversion (a,b values with a different superscript are significantly different at $P < 0.05$)

Table 2. Bone ash (%) at day 44 and digestibility (%) of dry matter, ash, Ca and P at 40-44 days of age

	Bone ash	Digestibility			
		Dry matter	Ash	Calcium	Phosphorus
Positive control	66.1 ^a	71.1 ^a	47.2 ^a	56.0 ^a	48.6 ^b
Negative control	63.0 ^b	69.3 ^b	33.1 ^c	46.6 ^b	42.9 ^c
Negative control + 250 FTU	64.4 ^{ab}	71.1 ^a	39.9 ^b	58.2 ^a	54.0 ^a

a,b values with a different superscript are significantly different at $P < 0.05$

Conclusion

- Adding OptiPhos® Plus G at 250 FTU/kg to a feed reduced by 1.5 g/kg aP and 1.0 g/kg Ca brought performance back to the level of the positive control, and increased bone ash and P digestibility.
- Based on the bone ash results and the dig. P value measured, it could be calculated that 250 FTU/kg OptiPhos® Plus G equals 0.78 g aP and 0.67 g dig. P (as MCP) respectively.