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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 outcompetes OptiPhos® CT in broilers at 500 and 1000 FTU/kg

Trial description

1 Set-up

- **Location:** University of Warmia and Mazury, Poland
- **Trial period:** March – April 2019
- **Animals:** 792 male Ross 308 broilers distributed over 72 pens (6 treatments with 12 repetitions of 11 birds/pen).
- **Feeds** (Table 1; pelleted)
  - Starter (d 0-5): 21.5 % CP; 1.1 % dig. Lys; 2950 kCal/kg AME broiler; 0.90 % Ca; 0.45 % aP; fed to all treatments
  - Grower (d 5-21): 20.3 % CP; 1.03 % dig. Lys; 3021 kCal/kg AME broiler
    - o positive control: 0.8 % Ca, 0.64 % total P and 0.35 % aP
    - o negative control: 0.65 % Ca, 0.46 % total P and 0.17 % aP
  - Finisher (d 21-35): 19.0 % CP; 1.0 % dig. Lys; 3094 kCal/kg ME broiler
    - o positive control: 0.75 % Ca, 0.62 % total P and 0.32 % aP
    - o negative control: 0.60 % Ca, 0.46 % total P and 0.15 % aP

2 Treatments (only grower and finisher)

- Positive control
- Negative control
- Negative control + OptiPhos® Plus G at 500 or 1000 FTU/kg
- Negative control + OptiPhos® CT at 500 or 1000 FTU/kg

3 Measurements

- Technical result: growth, feed intake and FCR.
- At day 21, 2 birds per pen were selected of which the right tibia was removed (pooled to one sample) followed by determination of tibia ash on fat free dry matter.

Table 1. Feed composition and analysis (g/kg)

Feed composition	Starter	Grower		Finisher	
		Positive control	Negative control	Positive control	Negative control
Corn	582	580	596	563	578
Soybean meal 48 % CP	301	243	240	193	190
Sunflower HiPro	20	30	30	50	50
Rapeseed meal	30	70	70	100	100
Animal fat	0	20	20	30	30
Soybean oil	25	20.5	15.5	30	25
Lime fine	14	12.8	12.5	11.5	11
MCP	15	10.4	2.5	9.2	1.8
Others*	14.5	13.7	13.7	14.0	14.0
Nutrients					
Crude protein	215	203	203	194	195
Dig Lys	11.0	10.3	10.3	10.0	10.0
Ca	9	8	6.5	7.5	6
P total	7.2	6.4	4.6	6.2	4.6
aP	4.5	3.5	1.7	3.2	1.5
ME broiler (Kcal/kg)	2947	3021	3021	3094	3094

** Salt, sodiumbicarbonate, synthetic amino acids and vitamin/mineral premix*

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Results

- OptiPhos® Plus G added at 500 FTU/kg ensured no significant difference in end body weight when compared to the positive control while FCR was 0.03 points lower. OptiPhos® CT at 500 FTU/kg performance was comparable to the positive control in terms of FCR, however it did not enable final body weight to be sufficiently recovered (Fig. 1).
- At the inclusion level of 1000 FTU/kg the difference in end weight between both phytases was less than the difference observed when dosed at 500 FTU/kg. No differences were observed between phytases on FCR was seen at this inclusion level.
- The effect of OptiPhos® Plus G at 500 FTU/kg on bone ash was significantly better compared to OptiPhos® CT. OptiPhos® Plus increased bone ash levels in line with the positive control (Table 2).
- Based on the bone ash results, it could be calculated that 500 and 1000 FTU/kg OptiPhos® Plus G equals 1.44 and 1.85 g/kg aP respectively, while this was 1.05 and 1.57 g aP/kg for OptiPhos® CT.

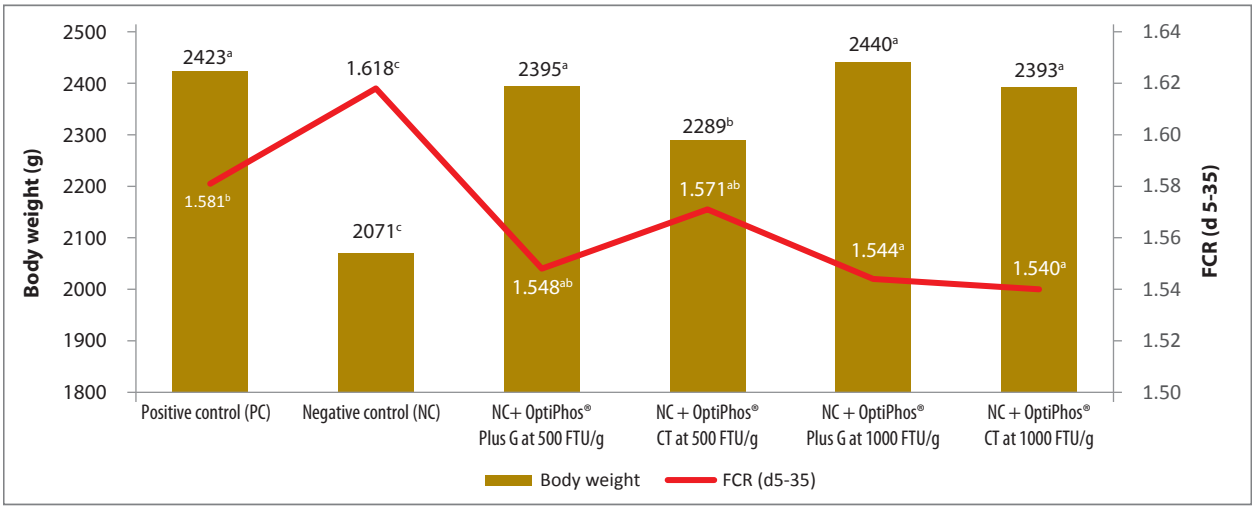

Fig. 1. Effect on body weight and feed conversion at day 35 (a,c values with a different superscript are significantly different at P<0.05)

Table 2. Doses response of both phytases on bone ash

	Bone ash (%)
Positive control (PC)	48.6^{ab}
Negative control (NC)	40.8^{d}
NC + OptiPhos® Plus G 500 FTU	47.8^{b}
NC + OptiPhos® CT 500 FTU	45.9^{c}
NC + OptiPhos® Plus G 1000 FTU	49.8^{a}
NC + OptiPhos® CT 1000 FTU	48.4^{ab}

a,c values of line or column followed by different letter are sign. different (p< 0.05)

Conclusion

- OptiPhos® Plus G at 1000 FTU/kg enables a dietary reduction of 1.8 g/kg in aP when compared to the positive control by reaching nearly similar bone ash and end weights.
- An aP value of 1.44 and 1.85 g/kg aP could be calculated for OptiPhos® Plus at 500 and 1000 FTU/kg respectively based on the bone ash analysis.

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