

## Enhanced vitamin D content of chicken by UVB bio-enrichment does not influence sensory evaluation

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Bio-enrichment practices such as animal UVB exposure effectively enhances vitamin D content of meat<sup>(1)</sup>. Consumers may favour vitamin D bio-enriched products owing to the natural appeal of production<sup>(2)</sup>, but changes in sensory characteristics should be minimised to ensure consumer acceptability<sup>(3)</sup>. This study aimed to 1) investigate daily UVB exposure on vitamin D metabolites in chicken meat, and 2) to determine sensory evaluation of UVB bio-enriched chicken goujons compared to control goujons. Ross 308 broiler chickens were exposed daily to UVB exposure ( $n = 30$ ) or control (no UVB) ( $n = 30$ ) for 6 weeks prior to slaughter. Samples of cooked bio-enriched and control chicken meat (50g) were retained for analysis. The remaining meat was minced and used to prepare two batches of goujons (bio-enriched and control) with the addition of salt, garlic and onion powder. Meat was formed and shaped into goujons, coated in batter, breadcrumbs, and fried in rapeseed oil (180°C, 1.4mins). Prepared goujons were frozen prior to sensory evaluation. Consenting adults ( $n = 50$ ) aged 18–65 years were recruited. Chicken goujons were oven roasted (180°C) until an internal temperature of 75°C was reached. Participants were presented with a trio of goujons ( $n = 1$  bio-enriched;  $n = 2$  control) each randomized by a three-digit code. Participants were asked to rate five hedonic sensory parameters; appearance, aroma, taste, texture, and overall liking rated from 1-10 (1, extremely dislike; 10, extremely like) for each goujon. Vitamin D<sub>3</sub> and 25(OH)D<sub>3</sub> (µg/kg), were analysed in cooked chicken meat and goujons by LC-MS/MS. Vitamin D activity was defined as: [vitamin D<sub>3</sub> + (25(OH)D<sub>3</sub> × 5)]<sup>(4)</sup>. Daily UVB exposure of chickens resulted in a significant increase in mean ± SD vitamin D<sub>3</sub> in cooked chicken meat compared to control ( $3.0 \pm 0.9$  µg/kg vs.  $2.1 \pm 0.6$  µg/kg,  $P < 0.001$ ). No significant difference was observed for 25(OH)D<sub>3</sub> and vitamin D activity between groups (both  $P > 0.05$ ). Bio-enriched chicken goujons demonstrated a significant increase in vitamin D<sub>3</sub> ( $1.2 \pm 0.1$  µg/kg vs.  $0.8 \pm 0.1$  µg/kg,  $P < 0.001$ ) and a significant increase in vitamin D activity ( $6.8 \pm 0.3$  µg/kg vs  $6.4 \pm 0.2$  µg/kg,  $P < 0.05$ ). There was no difference in 25(OH)D<sub>3</sub> concentrations between the two types of goujons ( $P = 0.894$ ). Sensory evaluation revealed mean hedonic scores ranged from 6.8-7.8 and observed no difference across all parameters; appearance, aroma, taste, texture, and overall liking between UVB bio-enriched and control goujons ( $P > 0.05$ ). Ross 308 broiler chickens exposed short-term to UVB light significantly increased vitamin D<sub>3</sub> metabolites in cooked chicken and bio-enriched goujons. UVB bio-enrichment did not impact hedonic sensory analysis in chicken goujons, and similar levels of consumer acceptability indicate this may be a feasible strategy to increase vitamin D dietary sources for consumers. Future qualitative research is warranted to further explore market potential of vitamin D bio-enriched products.

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