# Effects of incorporating 3% and 6% nettle powder on zootechnical performance, oxidative status and physicochemical characteristics of commercial turkey meat

**Sadoudi A.[1], Ait-Kaki A.[2], Bellik Y.[3], Touazi L.[4], Iguer-Ouada M.[5], Hornick J.L.[1], Moula N.[1,6]**

*1. . Department of Veterinary Management of Animal Resources, FARAH Center, Faculty of Veterinary Medicine, University of Liège, Belgium*
*2. Faculty of Sciences, Department of Biology, University of M'Hamed Bougara, 35000 Boumerdès, Algeria*
*3. Department of Biology, Faculty of Life and Nature Sciences, Mohamed El Bachir El Ibrahimi University, Bordj Bou Arreridj, 34000, Algeria*
*4. Department of Agronomy, Faculty of Nature and Life Sciences, Ferhat Abbas University of Setif, EL Bez, Setif 19000, Algeria*
*5. Associated Laboratory in Marine and Aquaculture Ecosystems, Faculty of Nature and Life Sciences, University of Bejaia. Algeria*
*6. GIGA Animal Facilities, University of Liege, Belgium*

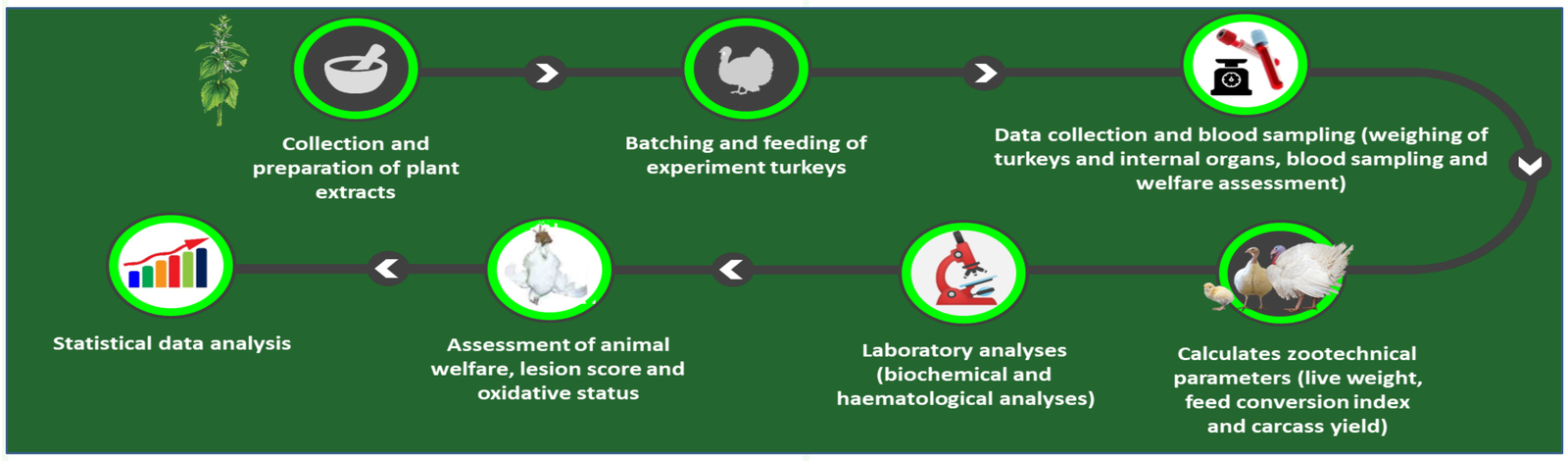
## Introduction

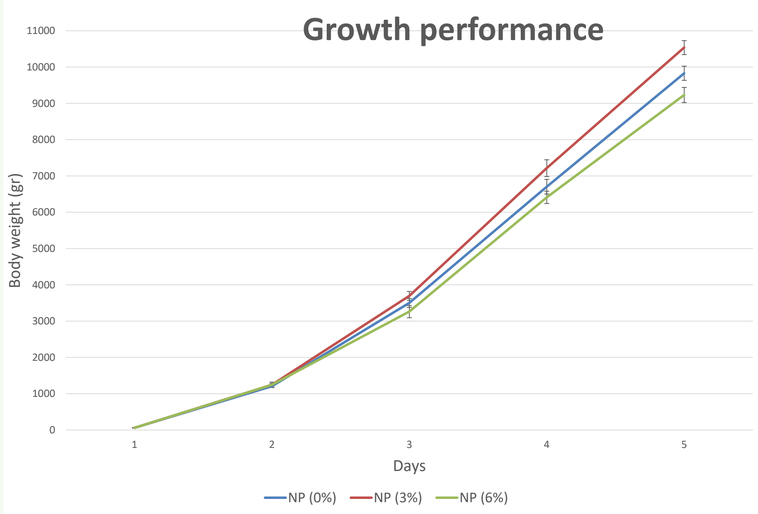
Thanks to its short production cycle, the poultry sector offers a source of high-quality animal protein at an affordable price. In Algeria, however, this vital sector faces several constraints that are holding back its development. Feed, with its high costs, remains the main constraint to the development of turkey farming in Algeria.

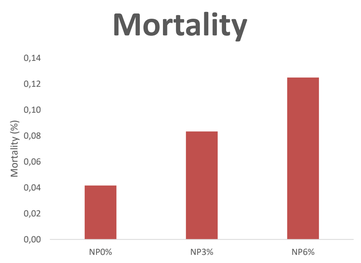
The aim of this study was to investigate the impact of incorporating nettle (*Urtica dioica L.*) on animal performance, biochemical and physicochemical parameters of the meat, and the oxidative status of turkey (Meleagris gallopavo) reared under intensive rearing conditions.

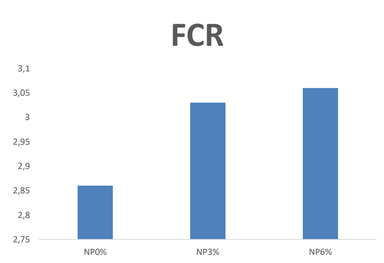
## Materials and Methods

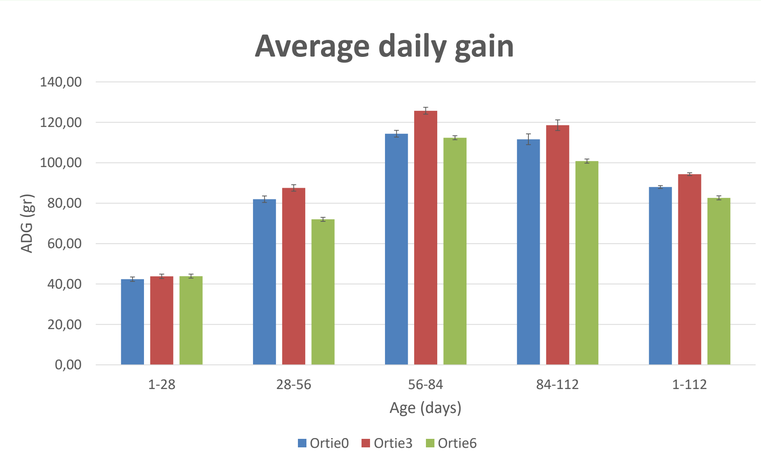
The experiment was carried out by comparing two rates of dietary incorporations, 3 and 6%, of nettle powder (NP) in three commercial feeds formulated for three growth phases, during 12 weeks of rearing. The feed was distributed *ad-libitum* during the whole rearing phase. A total of 72 one-day-old turkeys were assigned to 3 dietary treatments (NP0%, NP3%, NP6%), consisting of 3 replicates of 8 birds each.


| Meat chemical composition | | | | | |
|---|---|---|---|---|---|
| Chemical composition | NP (0%) | NP (3%) | NP (6%) | R2 | P-value |
| Water | 73.16 | 72.66 | 72.50 | 0.03 | 0.82 |
| Protein | 21.00 | 21.83 | 20.67 | 0.07 | 0.58 |
| Fat | 3.50 | 3.01 | 2.72 | 0.28 | 0.08 |
| Ash | 1.09 | 1.15 | 1.18 | 0.04 | 0.71 |
| **Meat quality** | | | | | |
| pH24 | 5.85 | 5.90 | 5.95 | 0.1 | 0.46 |
| WHC | 22.17 | 21.33 | 20.83 | 0.14 | 0.31 |
| Cooking loss | 8.72 | 8.58 | 8.13 | 0.13 | 0.36 |
| Redness 24 A* | 14.83 | 16.00 | 15.66 | 0.08 | 0.52 |
| Yellowness 24 b* | 5.50 | 5.17 | 5.00 | 0.04 | 0.75 |
| Brightness 24 L* | 50.33 | 49.5 | 48.83 | 0,05 | 0,69 |

## Results

Nettle leave significantly improved live weight at 12 weeks of age ($p<0.05$), which was higher in the group fed 3% nettle powder than in the groups fed with 0% and 6% nettle powder (NP3%: 10534g; NP0%: 9829g; NP6%: 9233g; $p<0.05$).

Over the rearing period, NP0% group recorded a better feed conversion ratio (NP0%: 2.86; NP3%: 3.03; NP6%: 3.06; P=0.03). Mortality was similar between the three groups (8% on average).

Oxidative status was significantly affected by supplementation among the three groups ($p<0.001$). The antioxidant capacity, measured by the way of TAC, GP, SOD, CAT and MDA, was linearly improved with the level of incorporation of nettle powder ($p<0.001$).

No significant differences were recorded between the 3 groups for the chemical composition (water, protein, fat and ash) and the physicochemical parameters (pH24, WHC, cooking loss, redness, yellowness and brightness) of meat

| Oxidative status of turkeys | | | | | | |
|---|---|---|---|---|---|---|
| | NP (0%) | NP (3%) | NP (6%) | SEM | R2 | P-value |
| Total Antioxidant Capacity (U/mL) | 2.85 | 4.03 | 4.38 | 0.17 | 0.75 | <0.001 |
| Glutathion Peroxidase (U/mL) | 1536.17 | 1571.83 | 1652.67 | 10.7 | 0.80 | <0.001 |
| Super oxide dismutase (U/mL) | 144.33 | 159.83 | 167.77 | 2.57 | 0.74 | <0.001 |
| Catalase (U/mL) | 1.50 | 1.58 | 1.73 | 0.04 | 0.58 | 0.015 |
| Malon dialdehyde (mmol/ml) | 2.85 | 2.60 | 2.28 | 0.06 | 0.74 | <0.001 |

## Conclusion

The supplementation of turkey feed with nettle powder at the rate of 3% improved bird's growth performance and antioxidant capacity.