

# Effect of *Urtica dioica* and *Urtica urens* on survival in broilers chickens

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# ✓ Why nettles?

## *Urtica dioica* & *Urtica urens*

Traditional uses – Nettles can be an additive in animal feed.

**Antibacterial, Antioxidant, Anti-inflammatory.....**



Flavenoids

Phenolics

Alkaloids

Tannins

Terpenoids

Saponins

Steroids

Anthocyanins

Coumarins

1. Positive effect on the immune system

2. Development of the digestive tract

3. Regulation the appetite and voluntary intake

4. Stimulation of basal metabolism

6. Cholesterol decreases

5. Increase the meat quality

**Some studies suggest a positive impact in broilers**



# *Urtica dioica* Vs. *Urtica urens*

- Main differences

| <i>U. dioica</i>         | <i>U. urens</i>                      |
|--------------------------|--------------------------------------|
| Higher 1,50m             | Smaller 0,60m                        |
| Spring                   | Winter                               |
| More studied             | Just few studies                     |
| More Dry Metter          | Less Dry Metter                      |
| Harvest leaves and seeds | Harvest all aerial part of the plant |





# Chemical composition





***Urtica dioica***

| Chemical Composition (g/kg Dry Matter) |                  |
|----------------------------------------|------------------|
|                                        | <i>U. dioica</i> |
| Organic Matter                         | 908              |
| Crude Protein                          | 182              |
| NDF                                    | 330              |
| ADF                                    | 209              |
| ADL                                    | 32               |
| Crude Fat                              | 19               |



***Urtica urens***

| Chemical Composition (g/kg Dry Matter) |                 |
|----------------------------------------|-----------------|
|                                        | <i>U. urens</i> |
| Organic Matter                         | 878             |
| Crude Protein                          | 147             |
| NDF                                    | 244             |
| ADF                                    | 237             |
| ADL                                    | 99              |
| Crude Fat                              | 23              |



## Phenolic compounds ( $\mu\text{g/g}$ dried nettle sample) analyzed by UHPLC-ToF-MS

| Phenolic compounds          | <i>Urtica dioica</i>         | <i>Urtica urens</i> |
|-----------------------------|------------------------------|---------------------|
|                             | $\mu\text{g/g}$ dried nettle |                     |
| 4-O-Caffeoylquinic acid     | 9459.46 $\pm$ 196.81         | 5094.88 $\pm$ 42.17 |
| Quercitrin                  | 18.07 $\pm$ 1.78             | 1.05 $\pm$ 0.13     |
| Kaempferol-3-O-B-rutinoside | 40.54 $\pm$ 1.80             | 2.96 $\pm$ 0.16     |
| Genistin                    |                              | 1.37 $\pm$ 0.18     |
| Gallocatechin               | 168.84 $\pm$ 10.74           |                     |
| Isorhamnetin-3-O-glucoside  | 24.78 $\pm$ 0.33             |                     |
| Luteolin-7-O-glucoside      | 2.11 $\pm$ 0.34              |                     |
| Rosmarinic acid             | 9.91 $\pm$ 0.49              |                     |
| Epigallocatechin gallate    |                              | 1.06 $\pm$ 0.29     |
| Caffeic acid                |                              | 22.53 $\pm$ 0.58    |
| Rutin                       |                              | 21.49 $\pm$ 1.40    |





# ✓ Preparation of Urtica



→ Harvesting the nettles

→ Dehydration (50°C)

→ Crushing

→ Grinding into powder



Diet base

Mixed with the diet base



Diet + 1% UD



Diet + 1% UU

# Methods

- 240 male chicks of the Ross 308 AP strain;
- From one day old to 24 days of age;
- Housed in 30 pens with 8 birds each;
- Monitored the mortality;
- 3 treatments (10 replicates per treatment):
  - ✓ (CT) Control basal diet;
  - ✓ (UD) basal diet with 1% *Urtica dioica*;
  - ✓ (UU) basal diet with 1% *Urtica urens*.





# Methods

## Mortality

- Daily monitored
- The dead birds were necropsied to diagnose the causes of death.

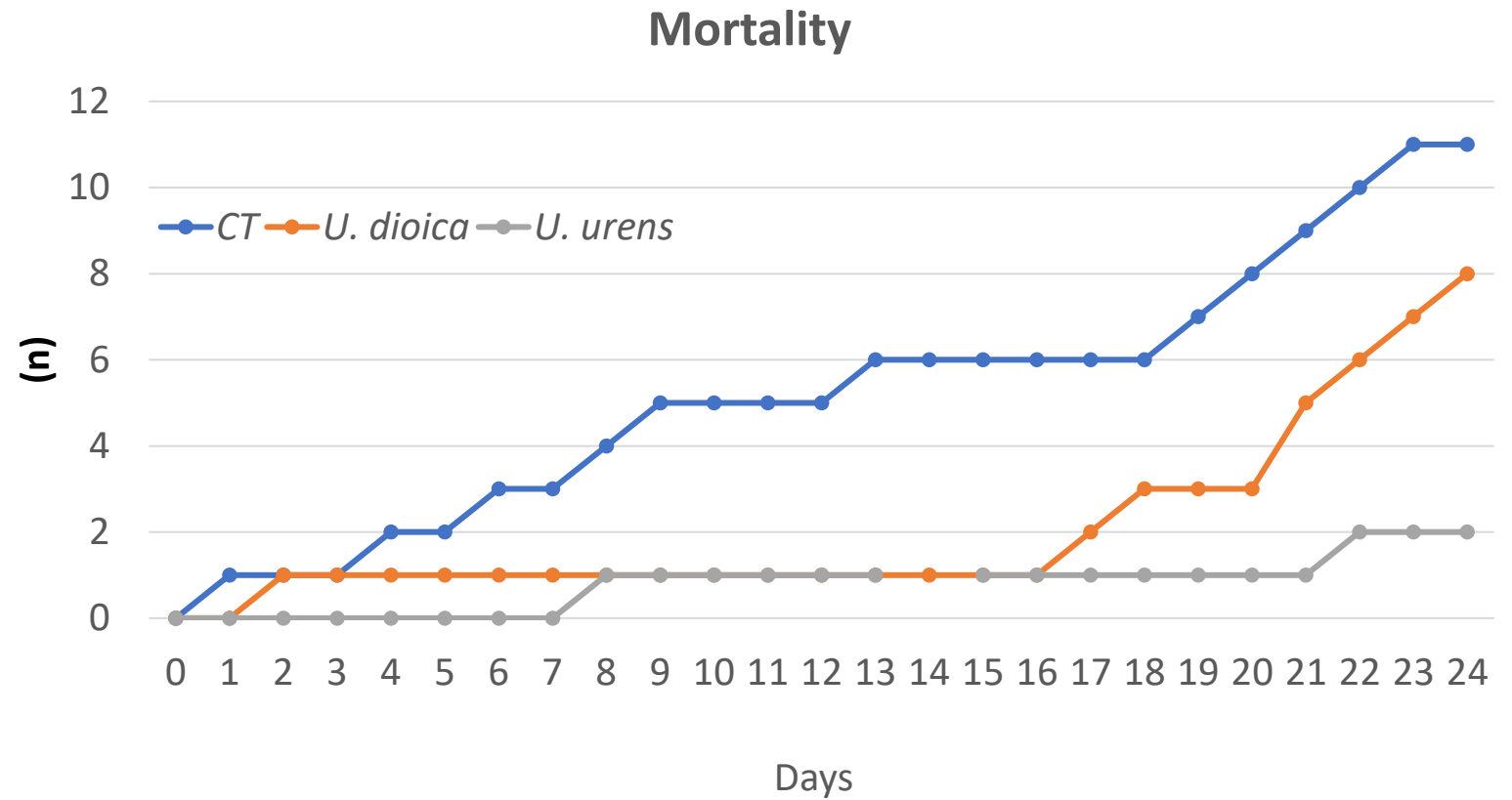


## Statistical analysis

- Independence test (ChiSq); and after (Exact Fisher Test) and (Odds Ratio) in JMP 17 Pro.

# Results

## Evolution in the trial





# Results

|       | n   | Deads | Alive | Prob>ChiSq |
|-------|-----|-------|-------|------------|
| CT    | 80  | 11    | 69    | 0.0373     |
| UD    | 80  | 8     | 72    |            |
| UU    | 80  | 2     | 78    |            |
| TOTAL | 240 | 21    | 219   |            |

Mortality depends on the treatment.

|       | n   | Deads | Alive | P-value | Odds Ratio (CI 95%) |
|-------|-----|-------|-------|---------|---------------------|
| CT    | 80  | 11    | 69    | 0.0174  | 6.22 [1.33; 29.03]  |
| UU    | 80  | 2     | 78    |         |                     |
| TOTAL | 160 | 13    | 147   |         |                     |

O. Ratio- CT has a 6.22 higher probability of mortality than UU

# Discussion

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Does nettle have effect on mortality?

| Found differences                                                                                                                      | No differences                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| The treatments that receive nettle had lower mortality than the control (Bekele <i>et al</i> 2015)                                     | There were no indications that the dietary treatments with <i>Urtica dioica</i> had an effect on bird mortality. (Safamehr <i>et al</i> 2012) |
| The lowest mortality rate – 0.83%, was observed in the group receiving water with <i>U. dioica</i> (Skomorucha & Sosnówka-Czajka 2017) | No treatment differences were found for mortality in diets with nettle (Loetscher <i>et al</i> 2013)                                          |





# conclusions

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- *Urtica urens* has a significant effect on the survival of broiler chickens.
- *Urtica dioica* did not show any difference.

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Thank you for the  
attention!