

Effect of Feeding Nettle Plants to Mice

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ABSTRACT

An experiment was conducted to study the possibility of utilizing the nettle plant (*Urtica urens*) as a feed for farm animals in Libya. Green and powdered leaves of nettle plants were mixed with a standard chick diet and fed to albino mice. Mice fed chopped green nettle leaves exhibited either reddening and/or blistering skin around the mouth. The irritational effect was eliminated when the leaves of the plant were either sun or oven dried.

INTRODUCTION

The research reported herein was initiated primarily to investigate the possibility of utilizing a very common, but normally non-palatable and irritant plant, as a source of feed for animals in Libya. The nettle (Fig. 1A and 1B) grows extensively throughout Libya and normally animals avoid it due to the irritation caused by the formic acid present in the plant (1). It was felt, however, that if the plant was subjected to drying, the formic acid would evaporate leaving a suitable dry fodder. The experiment was conducted with mice for two main reasons: (1) mice are known to be extremely sensitive experimental animals, and (2) should the animals be seriously affected by the experimental plant, very little would have been lost economically.

MATERIALS AND METHODS

One hundred (100) 4-week-old albino mice were divided equally into 4 groups (25 per group) and subjected to 4 experimental treatments. The control mice were permitted to eat standard chick diet *ad libitum*. In the other three treatments, the mice were given the standard chick diet mixed with either chopped green powdered, sun dried, or oven dried, nettle plants, at the rate of 2 grams of plant per mouse daily. Individual bodyweights of the mice were taken initially and at the end of the 16 week experiment. Feed consumption was recorded daily. The experimental animals were checked daily for skin irritation, diarrhoea, or other symptoms. After 16 weeks on the experiment a representative sample of 5 mice were taken from each experimental group. The animals were killed and pieces of tissue were taken from the small and large intestines, spleen, liver, stomach, thyroids, parathyroid, ultimobranchials, testes, and ovaries. The tissues were fixed in 10% formalin and dehydrated in graded series of alcohol solutions and embedded in paraffin. Sections 7 microns thick were prepared for detailed microscopic study. Post-mortem examinations were conducted on the remaining mice.

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Table 1 Live-weight changes and feed consumption of mice fed nettle plants¹ in various forms (25 mice per treatment)

Parameters (grams)	Treatments			
	Chick diet (Control)	Green nettles	Sun dried nettles	Oven dried nettles
Average initial wt.	19	16	18	18
Average final wt.	31	28	31	31
Total gain ²	14 ^a	12 ^a	13 ^a	13 ^a
Average daily feed consumption ³	14 ^b	8 ^a	12 ^b	14 ^b

¹Nettles, green and dried, were fed at the rate of 2 grams (dry matter) per mouse daily.

^{2,3}Within each parameter, means with different superscripts differ significantly ($P < 0.05$) from each other.



Fig. 1-A. The nettle plant, *Urtica urens*.



Fig. 1-B. A close-up picture of a leaf of *Urtica urens*.

RESULTS AND DISCUSSION

Feed consumption: Significant differences ($P < 0.05$) were found in feed consumption among the treatment groups (Table 1). Mice on feed containing chopped green nettle consumed the least amount, compared with the mice involved in other treatments. The reduction in feed consumption seems to be due to the irritant characteristics of the plant. Mice on this treatment exhibited red and blisterous areas around the mouth (Fig. 2). Watt and Breyer-Brondwik (3) indicated that the irritation of the nettle arises from the precutaneous injection of formic acid produced at the base of the stinging hair. Contact results in the hair breaking off at the tip and the injection of the fluid. This results in reddening accompanied by marked itching and swelling.

Mice fed diets mixed with sun dried or oven dried nettle leaves showed no signs of irritation, suggesting that drying eliminated the irritational effects. Tofer (2) found that powdered nettle hay was suitable for feeding and storage. He reported that the plant contained 21%–23% crude protein, 3.4%–5.2% fat, 35%–39% nitrogen-free extract, 9%–21% crude fibre, and 19–29% ash.



Fig. 2. Blistered mouth as a result of feeding green, chopped nettle plants.

Bodyweight gain: There were no significant differences among the treatment means (Table 1). The average total gain of mice fed green nettle leaves was slightly lower than that of mice on the other treatments.

Post-mortem: No post-mortem changes were found in any of the experimental mice.

Histological changes: Tissue preparation from mice fed green or dried nettle leaves did not show histological changes as observed under the light microscope.

LITERATURE CITED

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تأثير تغذية نبات الحريق
(النتل) على الفئران

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المستخلص

لقد تمت دراسة تأثير نبات الحريق على الفئران واتضح بأن تغذية العئران بهذا النبات قبل تجفيفه بحرارة الشمس أن الفرن ينتج عنه احمرار وخدوش بالجلد حول الفم ، وعند تجفيفه اختفى التأثير ، والفرض من هذه التجربة هو دراسة امكانية الاستفادة من هذا النبات عند توفره فى المراعى لتغذية الحيوانات وخاصة المجتره منها بعد تجفيفه لرفع أثر الحساسية التى تعتبر السبب فى عدم اقبال الحيوانات عليه فى المراعى .