International Journal of Veterinary Sciences and Animal Husbandry

ISSN: 2456-2912
VET 2024; SP-9(1): 266-267

www.veterinarypaper.com
Received: 25-11-2023
Accepted: 28-12-2023

Dr. Rupal Dadhich
Department of Animal Husbandry, Veterinary Officer, Veterinary Polyclinic, Bikaner, Rajasthan, India

Dr. RK Dhuria
Professor & Head Department of Animal Nutrition, College of Veterinary and Animal Science, Rajasthan University of Veterinary & Animal Sciences, Bikaner, Rajasthan, India

Corresponding Author:
Dr. Rupal Dadhich
Department of Animal Husbandry, Veterinary Officer, Veterinary Polyclinic, Bikaner, Rajasthan, India

Comparative proximate composition of maize grain and hydroponics maize fodder

Dr. Rupal Dadhich and Dr. RK Dhuria

Abstract
Nutritional composition of hydroponic maize fodder and maize grain were compared in the study. Proximate principles were determined by AOAC (2000). It was observed that the percent DM, OM, EE and NFE was lower in hydroponics maize fodder but percent CP, CF, Total Ash was higher when compared with maize grain.

Keywords: Proximate composition, maize grain, hydroponics maize fodder

Introduction
Out of the world's livestock population India consists 15% cattle, 57% buffaloes,17% goats, 7% sheep and about 2% camels(Source: BAHS, 2012) [2]. This huge population of livestock requires about 475 million tonnes dry fodder, 800 million tonnes green fodder and 78 million tonnes concentrate on annual basis but the deficiencies of concentrate feed, green fodder and dry fodder are estimated to be 25,159 and 117 million tonnes respectively (Ravi Kiran Gorti *et al*., 2012) [6]. The gap of demand and supply is widening to the extremes leading to the desperate situation of scarcity. Green fodder is quintessential for growth and reproductive performances in livestock. Hydroponics technology is arising as the suitable alternate for making the greens available in edaphic and climatically challenged area. Quality fodder, rich in nutrients, vitamins and minerals, requiring very low water is grown by hydroponics technology.

Materials and Methods
Hydroponics maize fodder is grown from maize grain in hydroponics chamber equipped with automatic irrigation. The grains were soaked overnight followed by transferring in trays to the top most row of the chamber thereby shifting in lower rows in consecutive days. On 8th day it is then harvested. The preliminary index for feed quality assessment is the chemical composition. The sample of maize grain hydroponics maize fodder were analysed for proximate principles *viz*., Dry matter, crude protein, ether extract, crude fibre, nitrogen free extract, total ash was determined by AOAC (2000) [1]. Total Nitrogen content was determined by Kjeldahl's method using KelPlus Semi automatic nitrogen analyzer and Ether extract was determined by Soxhlet's apparatus. Standard conventional procedures determined dry matter, crude fibre and total ash. Nitrogen free extract was calculated by Weende's method.

Results and Discussion
The chemical composition of hydroponics maize fodder and maize grain is presented in the Table-1. From Table-1 it was observed that the percent DM, OM, EE and NFE was lower in hydroponics maize fodder but percent CP, CF, Total Ash was higher when compared with maize grain. The ash and protein content of sprouts increased corresponding with the extension of the radical, which allows mineral uptake. The absorption of nitrates facilitates the metabolism of nitrogenous compounds from carbohydrate reserves, thus increasing crude protein levels (Morgan *et al*. 1992) [7]. Dung *et al* (2010) [4] reported that after sprouting for a period of 7 days, 21.9% loss in DM and loss of 2% GE was recorded the original grain. The CP, ash and all other minerals except potassium were lower in concentration on a DM basis in

the barley grain than in the sprouts. This was considered to be loss in DM after sprouting causing a shift in concentration of these nutrients. Fazali *et al*. (2012) [5] reported that the crude protein, ash, ether extract, neutral detergent fibre and acid detergent fibre were increased but NFC and WSC reduced in green fodder in comparison to barley grain. Peer and Leeson (1985b) [8] found that during sprouting, weights of dry matter, nitrogen free extract and gross energy decreased markedly (p<0.05). A smaller reduction in protein weight also occurred. Weights of ash and fat increased slightly and fibre increased markedly with increased sprouting time. Thomas and Reddy (1962) [9] reported that the sprouted oats were 4.2 to 7.5 times heavier. Crude protein and crude fibre on dry matter basis were 61 and 17% more, respectively, and the nitrogen free extract was 15% less than the seeds. Chung *et al.* (1989) [3] reported that sprouting were associated with depletion of many nutrients in barley and canola, the major losses being in respect of dry matter, gross energy and triglycerides.

Table 1: Chemical composition of Hydroponics Maize Fodder and Maize grain

Attributes	DM	OM	CP	EE	CF	NFE	TA
Hydroponics Maize Fodder	16.53	96.9	18.21	3.65	7.74	67.30	3.10
Maize Grain	9.45	98.13	9.5	4.05	1.15	83.43	1.87

Conclusion

Maize grain is higher in OM, EE, NFE whereas hydroponics maize fodder is higher in DM, CP, CF & TA.

References

1. A.O.A.C. Official method of analysis, 17th Edn., Association of Official Analytical Chemists, Washington, D.C., U.S.A; c2000.
2. BAHS. Basic Animal Husbandry Statistics, Department of Animal Husbandry Dairying and Fisheries. Ministry of Agriculture. Government of India; c2012.
3. Chung T, Nwokolo EN, Sim JS. Compositional and digestibility changes in sprouted barley and canola seeds. Plant Food Hum Nutr. 1989;39:267-278.
4. Dung DD, Godwin IR, Nolan JV. Nutrient content and in sacco degradation of hydroponic barley sprouts grown using nutrient solution or tap water. J An. Vet Adv. 2010;9:2432-2436.
5. Fazaeli H, Golmohammadi HA, Tabatabayee SN, Asghri-Tabrizi M. Productivity and nutritive value of barley green fodder yield in hydroponic system. W App Sci J. 2012;16(4):531-539.
6. Gorti RK, Suresh KP, Sampath KT, Girdhar K, Anandan S. Modeling and forecasting livestock and fish resources: requirement and availability in India. National Institute of Animal Nutrition and Physiology, Bangalore; c2012.
7. Morgan J, Hunter RR, O'Haire R. Limiting factors in hydroponic barley grass production. 8th International Congress on Soilless Culture, Hunter's Rest, South Africa; c1992.
8. Peer DJ, Leeson S. Nutrient content of hydroponically sprouted barley. A. Fd. Sci Tech. 1985;13:191-202.
9. Thomas JW, Reddy BS. Sprouted oats as a feed for dairy cows. Q Bull Mich Agric Exp Stn. 1962;44:654-665.