

Antioxidative activities of alfalfa and timothy varieties

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Introduction The term “functional foods” is often used as a generic description for the beneficial effects of ingested foods that go beyond their traditional nutritive value (Bauman et al., 2001). Milk and dairy products are important dietary sources of nutrients, providing energy, high quality protein, and a variety of vitamins and minerals. Recent research has focused on altering the fat and protein content of milk and other dairy products in order to improve their nutrient content to more aptly reflect current dietary recommendations and trends. As a result, additional focus is being given to designing foods that have beneficial effects on human health. This study was carried out to investigate the antioxidative activities of forages grown in Korea.

Materials and methods Nine alfalfa cultivars and eight timothy cultivars grown in an alpine area (altitude 800 m) were used in this study. Methanol extracts from each were tested for radical scavenging ability using the DPPH (1,1-diphenyl-2-picrylhydrazyl) method as determined by UV spectrophotometry (Uchiyama et al., 1968). Effect of drying method (oven drying vs. drying in shade) on antioxidative activities of alfalfa was also compared. Tests with timothy were conducted only on oven dried forage.

Results Examination of methanol extracts from alfalfa and timothy for radical scavenging effects revealed large differences among forage varieties. Extracts from ‘Horizon’ and ‘DK 125’ had the strongest antioxidant activity among alfalfas and ‘Argus’ and ‘Itasca’ extracts had the greatest antioxidant activity of the timothy varieties (Figures 1, 2). Antioxidative activities of shade-dried alfalfas (av. 0.101mg) were greater than those of oven dried forage (av. 0.056mg).

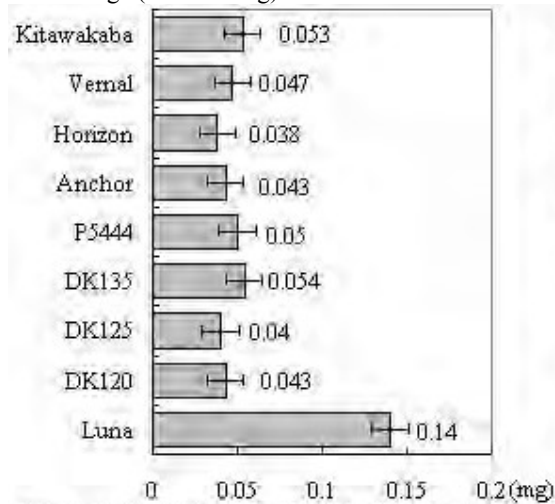


Figure 1 Antioxidative effect* of MeOH extracts from oven-dried alfalfa cultivars

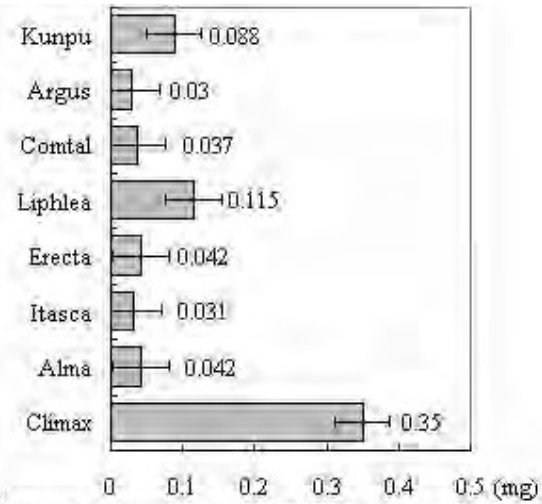


Figure 2 Antioxidative effect* of MeOH extracts from oven-dried timothy cultivars

*Amount required for 50% reduction of DPPH(2×10^{-7} ml, 0.079mg) solution

Conclusions Results of this study demonstrate that there can be large differences in antioxidant activities among forage cultivars, especially within timothy cultivars. These data suggest great potential for manipulating such potentially beneficial characteristics of forages. Further research on cultivar differences and management practices, impacts to animal production and health, and healthfulness of the product for human consumers is needed.

References

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