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Chicory - A Multipurpose Herb

Chicory (*Cichorium intybus* L.) belongs to an Asteraceae family is an aromatic, medicinal biennial or perennial herb. It is well-known over the world for its culinary, medicinal, and nutritional benefits. It is grown as weed in berseem during *rabi* cultivation and having the robust regenerative capacity which infest the berseem crop sown with berseem/lucerne seeds in the field. The plant can also be used to augment cattle feed that mixed with beseem/lucerne forage at the time of harvesting.

INTRODUCTION

Chicory is a perennial herbaceous plant that belongs to the Asteraceae family. It has been used as cattle feed in various parts of the world since prehistoric times. Its popularity is progressively increasing these days as a result of its numerous culinary, medicinal, and nutritional benefits. Many chicory elements, such as leaves, seeds, and roots, have been utilised successfully as supplements in small ruminant diets without impairing its performance.

The leaves and blossoms are commonly used as a coffee substitute and feed for cattle. Its extract is used to enhance the flavour of alcoholic and non-alcoholic beverages, and the inulin-rich tuberous roots can be turned to alcohol. Chicory plant components are utilised as an ethno veterinary treatment for physiological ailments and disorders, as well as for preventative purposes in both animals and people, in several nations. Because raw chicory roots are bitter, they are usually debittered by boiling, drying, baking, or roasting them, then soaking them in water or citric acid solution before being chopped or milled and utilised in coffee blends, feed, or functional food additives. Chicory roots include inulin (a starch-like polymer), flavonoids, coumarins, sesquiterpene, tannins, lactones, alkaloids, minerals, vitamins, and volatile oils, among other phytochemicals. Chicory's secondary metabolites (flavonoids, tannins, and coumarins) have been shown to have anti-oxidant, anti-cancer, anti-inflammatory, antiparasitic, and antihepatotoxic properties, all of which have a good impact on human and livestock health. Inulin is a fructose polymer that

makes up much to 68 percent of the total components in fresh chicory roots.

Furthermore, the performance of animals fed forage chicory is comparable to that of legumes and superior to that of grass-based pastures. Chicory, when used as a pasture supplement, boosts milk production.

Source: Internet

CHICORY PHYTOCHEMICAL COMPONENTS

Phenolic acid, which includes chlorogenic acids, and flavonoids are two of the most frequent phytocompounds (anthocyanins, flavonoids, flavanone, and flavan-3-ols). Plant polyphenols are commonly found as glycosides, which are less reactive and easier to store in the vacuole of the cell. Hexose, glycose or galactose, deoxyhexose, rhamnose, pentose, xylose or arabinose, and glucuronic acid are released as a result of cleavage of the glycosidic bond and related rearrangement events. Anthocyanins have been shown to protect artery walls, suppress platelet aggregation, and protect endothelial tissues in animals, lowering the risk of coronary heart disease.

Chicory contains phytocompounds that promote animal health, including condensed tannins. When tannins are present in high concentrations in the food, however, it can have a negative impact on animal productivity. On a dry weight basis, fresh chicory roots contain 68% inulin, 14% sucrose, 6% protein, 5% cellulose, 4% ash, and 3% other chemicals.

By weight, dry chicory root extracts contain around 98% inulin and 2% additional chemicals. Chicory seeds contain a significant level of crude protein, which accounts for more than 19% of the dry weight and is 1.6-2.4 times that of most traditional grains such as wheat, rice, corn, and barley. Chicory seeds are also high in the essential amino acid methionine, lysine, leucine, isoleucine, and phenylalanine, all of which are needed for a balanced diet.

CHICORY'S ETHNOMEDICAL BENEFITS IN LIVESTOCK PRODUCTION

The herb chicory has certain secondary metabolites that have ethnomedical effects. They are used as herbal treatments, such as for its hepatoprotective properties. Chicory contains inulin, a soluble dietary fibre that is especially advantageous in monogastric nutrition. It boosts the immune system and promotes the growth of host-beneficial gut bacteria like lactobacilli, while lowering the number of harmful bacteria in the intestine and the risk of osteoporosis. When incorporated in male pig diets, it also decreases odorous chemicals in colon and rectal contents.

Cichorium intybus (kasani) has a nutritional benefit in livestock, reducing lipid peroxidation in serum and organs while also enhancing growth efficiency, reproduction, and health. Antioxidant, anti-inflammatory, anti-cancer, anti-protozoal, anti-diabetic, anti-microbial, immunological, cardiovascular, hypolipidemic, gastroprotective, analgesic, anthelmintic, productive and reproductive enhancer, and wound healing qualities are among the other bioactive features. Chicory roots contain a polyphenolic acid that has health-promoting properties.

As a result, additional or complementary inclusions of chicory-based preparations rich in prebiotic saccharides and polyphenol can be utilised to support the beneficial qualities of a diet while also acting as food and herbal medicine. Chicory's condensed tannins and sesquiterpene lactones affect bovine protein utilisation efficiency and reduce intestinal parasites.

CHICORY AS A FEED FOR ANIMALS

Chicory herb has various nutritional contents depending on where it is in its growing cycle. Forage has a nutritional content of 14-24% CP and

70-80% digestibility in the leaves. Secondary metabolites have a beneficial effect on internal parasites in lambs, as well as lowering methane generation and increasing sheep reproduction rates.

Chicory has less fibre, more protein, more soluble carbohydrates, and a higher mineral concentration than other greens. Also, because of its high digestibility and low fibre content, it is not ideal as a sole diet for cows; yet, because of its high digestibility, it may be withdrawn from cows more quickly.

Despite the fact that chicory can produce high nitrate levels that rarely cause toxicity, it is nonetheless utilised seasonally in some regions to improve pasture quality and quantity.

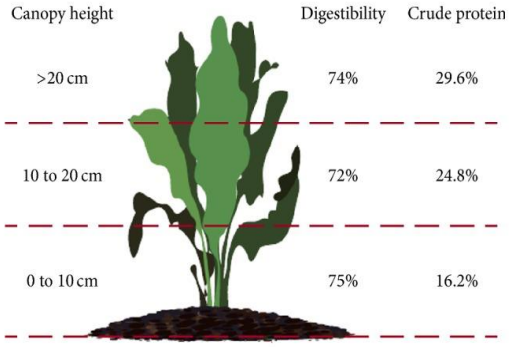

Figure 1. Quality of Chicory

CICHORIUM INTYBUS HAS ANTINUTRITIONAL EFFECTS

Plant secondary metabolites have harmful and toxic effects on live animal growth and performance when they surpass an acceptable intake level.

Alkaloids, saponins, lactones, terpenes, glycosides, and phenolic chemicals are active plant secondary metabolites that can harm the health of both ruminants and non-ruminants if consumed in excess. They're linked to haemolytic actions, ruminant bloat, lower feed intake, rumen metabolite impairment, nutritional absorption reduction, and, as a result, growth impairment. Phytochemicals have also had an impact on monogastric animals. Tannin suppresses growth and egg production in poultry at concentrations of 0.5-2.0%, and comparable effects have been shown in pigs. Low quantities of plant secondary metabolites, despite their antinutritional qualities, boost growth and milk output in sheep and cattle.

CONCLUSION

It is concluded that chicory (kasani) can be grown not only for phytochemical and medicinal properties but can also as a feed for livestock which needs to give more attention for its production.