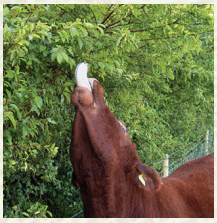
The Nutritional and Medicinal Value of Trees in a Dairy System

Tim Saunders BSc, MSc.

Introduction

Trees can have a variety of functions on dairy farms in the UK. It is widely accepted that trees in pasture are important for providing shade and shelter to stock. Using material from trees as fodder is an ancient practice. Despite this, relatively little research has taken place into the medicinal and nutritional value of trees to dairy cattle in a temperate climate.

Sustainable agriculture is increasingly important, as customer expectations change and environmental pressure grows nationally and globally. In a dairy system this means being carbon and nitrogen efficient while remaining economically viable. Tree fodder integrated into the diet of dairy cows may help achieve this at the same time as giving substantial health benefits.



Health benefits to dairy cows from browsing native trees come through three routes; either directly influencing productivity through protein content, through secondary metabolites acting as anti-parasitics and altering digestive processes, or through improved trace element provision.

Protein inputs and nitrogen efficiency

Dietary protein is an important consideration in a dairy system; many farmers use protein supplements to help maintain milk yield. Often a high percentage of dietary nitrogen is not utilised within the cow but is lost as waste. This is uneconomic and contributes to environmental problems. Tree fodder has good protein content but low digestibility – importantly however, it has the potential to increase efficiency of nitrogen uptake by shifting where proteins are digested from the rumen to the small intestine.

Trace elements

Trace elements such as zinc and copper are small but important components of a healthy diet for dairy cattle. The effects of deficiencies in zinc include low milk production and reduced reproductive capacity. Trees such as willow store much higher quantities of trace elements in their foliage than pasture species.

Medicinal value

The leaves and branches of many trees contain much higher concentrations of secondary compounds than the majority of pasture. These compounds were once thought to be anti-nutritional for herbivores. However, there is growing evidence that many can be useful as medicines in ruminants. Condensed tannins are one example – through their protein binding action they act as anti-parasitics. Studies have shown that ruminants dosed with condensed tannins, both in tree fodder and as an extract, can have a significantly reduced load of nematodes within as little as a month.

Which trees do dairy cattle prefer?

A partnership between the Woodland Trust and Harper Adams University is aiming to investigate the species preferences and browsing behaviour of dairy cows amongst rows of fodder and medicinal trees.

The Woodland Trust, Kempton Way, Grantham, Lincolnshire NG31 6LL.