Fate of condensed tannin after residing in various compartments of the digestive tract of dairy cows

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Condensed tannins (CT) in the ruminant diets had beneficial effect on utilization of dietary protein, therefore improved wool production, fertility and milk production. Condensed tannins also improved animal welfare and health through prevention of bloat, lowered parasitic burden and decreased ruminal methanogenesis. However, our understanding of the mechanisms of action of CT in the rumen and post-rumen compartments of the ruminant digestive tract is still not yet completely clear. Therefore, the fate of condensed tannins (CT) in the segments of the digestive tract of dairy cows and the fate of CT after *in vitro* incubation were determined in the current study. The fresh sainfoin (*Onobrychis viciifolia* cv. Esparcette and Ambra) were cut to 5-10 mm, weighed into nylon bags, then were incubated in the rumen for 2, 4, 7, 10, 24, 48 and 336h. In addition, sainfoin samples in the mobile nylon bags were pre-incubated in the rumen for 12h. Then after, these samples were incubated in the abomasum for 2.5h and from the abomasum through the digestive tract. The CT content were analysed in all samples after incubation in the rumen and in the abomasum and after passing through the digestive tract. In the *in vitro* study, sainfoin (Ambra) was incubated in 80-mL centrifuge tubes in buffered rumen fluid maintained under anaerobic condition at 39°C for 1, 2, 4, 8, 12 and 24h. At the end of each incubation time point, the tubes were centrifuged to separate solids from the liquid phase and both fractions were freeze-dried separately and analysed for CT content. The results show that the CT_Protein and CT_Fiber content were increased, however, the CT_Soluble content was decreased during 24h in vitro incubation. The CT_Protein and CT_Fiber content were increased up to 10h incubation in the rumen before they were decreased. The CT_Protein, CT_Fiber and CT_Soluble content were increased in the abomasum while they were reduced again after passage through the lower digestive tract. However, the CT_Soluble was immediately decreased after 2h incubated in the rumen. Based on the results of this current study, it could be concluded that in the entire digestive tract, condensed tannins are always in a form either condensed tannin bound protein or bound fiber. The form of condensed tannin depends on the segment of digestive tract.