Buffalo vs. Beef: Analyzing Lipid Content in Search of Potential Health Benefits (Phase II)

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Most Americans, including Native Americans, consume a diet high in fat from grainfed beef. Many of the health conditions witnessed across Indian country can be linked to elevated triglycerides, specifically those that are saturated. Thin Layer Chromatography (TLC) was conducted on previously extracted lipid samples in an attempt to further separate the lipid extract. Different eluent systems were tested to determine which was most effective. The system of hexane : diethyl ether : acetic acid (40:10:1 v/v) was deemed most effective and continued for all samples, while the other systems, including Silver Ion Chromatography, were discontinued. Upon plate development, separated bands were preliminarily identified based on the literature. Identities of the different lipid classes were then confirmed using Rf value calculations, and the triglyceride (TAG) band using Fourier Transform Infrared Spectroscopy (FTIR). Approximate areas of the TAG band on the TLC plates were calculated, and it was estimated that grainfed beef contained a 111% greater amount of total triglycerides when compared to grassfed buffalo, supporting results of the previous study. These results can be used for further qualitative and quantitative analysis of saturated and unsaturated fats using Gas Chromatography and Mass Spectrometry (GC-MS). Given that the health benefits of unsaturated fats and the health conditions linked to saturated fats are well known, the identification and quantification of the two in grassfed buffalo meat could provide new information regarding the benefits of a traditional diet to be used in the understanding and treatment of the current Native American diabetes epidemic.

Awards Won:

Fourth Award of $500