Rapid Immunoassay for the Detection of Bovine Adipose Tissue

Y-H. Peggy Hsieh¹ and Kamil Gajewski²
¹ Florida State University, Department of Nutrition, Food and Exercise Sciences, Tallahassee, FL 32306, USA
² Microtest Matrices Ltd., Bessemer Building, Exhibition Road, South Kensington, London SW7 2AZ UK

Identifying the species origin of adipose tissue in food or feed products is important for religious, cultural and food safety concerns. Currently there were no effective methods to identify the species of fat tissue in a mixture. This research was to develop a simple sample extraction method and investigate the feasibility of using commercial lateral flow strip immunoassay kits which were made to target a 23 kDa ruminant-specific muscle protein for bovine fat detection. A portion (50 gm) of pure fat, fat bi-mixtures, fat-and-meat-bone-meal (MBM) or fat-and-soybean meal mixtures (1-10% w/w) was rendered for 7 to 15 minutes. The drained residues after rendering were extracted with 0.5M NaCl solution. Commercial immunoassay kits, “Reveal for Ruminant in MBM” and “Reveal for Ruminant in Feed” were used to test the sample extracts. Both assays were able to detect bovine fat in various samples without cross-reaction with soy meal, porcine and poultry fats, and MBM. The “Reveal for ruminant in feed” assay was more sensitive and could detect at least 2% bovine fat in pork fat, 1% bovine fat in porcine MBM, and 0.5% bovine fat in soy meal. The reaction signal, however, was decreasing with the increase of rendering time. With the simple rendering-extraction method, low levels of bovine fat tissue can be rapidly distinguished from porcine or poultry tissues by using the rapid strip test. Results also imply that sufficient muscle proteins can be found in muscle-free adipose tissue and be used as the species marker for fat detection.