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The infective prion agent (PrPsc) is implicated in the pathogenesis of Transmissible Spongiform Encephalopathies (TSE) including CJD in humans, BSE in cow, CWD in deer and elk and scrapie in sheep and goat (1). The stability and resistance of this agent in the soil environment (2) and against conventional cleaning and sterilisation procedures (3) constitutes public health and agricultural challenges. Common physical and chemical decontamination methods are generally harsh, unsafe and inefficient (4-5). These limitations position the enzymatic approach to prion degradation as a potentially attractive and desirable environmentally friendly alternative (6-7).

The aim of this study was to constitute an enzymatic composition of biological degrades ME7 scrapie prion under mild digestion conditions. An enzymatic composition (EF+BS) was constituted with purified keratinase N22 isolated from farmyard waste and a biological agent (BS) derived from another bacterium. ME7 scrapie prion brain homogenate was digested with proteinase K (77 µg/ml for 1 h) to determine their effectiveness. The loss of PrPsc signal to undetectable levels by Western blot analysis. Time increasing disintegration of PrPsc with a significant loss of PrPsc signal was achieved with EF+BS enzymatic composition.

Results

Fig. 1: Lane 1 is ME7 brain homogenate digested with PK (77 µg/ml for 1 h). Lane 2 and 3 are a composition (EF+BS), Lane 4 and 5 are a homogenate digested with PK (77 µg/ml for 1 h) to determine their effectiveness.