Abstract—This study was designed to assess the effect of whey protein (WP) on metabolic status, the inflammation and anti-inflammation response, oxidative stress and the antioxidant defense system during the wound healing process in both non-diabetic and diabetic rats. WP at a dosage of 100 mg/kg of body weight, dissolved in 1% CMC, was orally administered daily to wounded normal (non-diabetic) and streptozotocin-induced diabetic rats for 8 days starting from the 1st day after wounding. The data revealed that WP enhanced wound closure and was associated with an increase in serum insulin levels in non-diabetic and diabetic rats and an alleviation of hyperglycemic and hyperlipidemic states in diabetic animals. The increase in insulin levels as a result of WP administration is associated with a marked multiplication of β-cells in the core of islets of Langerhans. WP induced a reduction in serum TNF-α, IL-1β and IL-6 levels and an increase in IL-10 levels, especially on the 4th day after wounding and treatment. WP also suppressed hepatic lipid peroxidation and stimulated the antioxidant defense system by increasing the level of glutathione and the activity of glutathione-S-transferase, glutathione peroxidase and superoxide dismutase (SOD) in wounded non-diabetic and diabetic rats. In conclusion, WP was observed to enhance wound closure by improving the diabetic condition, limiting prolonged inflammation, suppressing oxidative stress and elevating the antioxidant defense system in diabetic rats.

Keywords— Whey protein, Wound healing, Streptozotocin diabetic rats, Cytokines, Oxidative stress.