Chapter 6

Summary
This study was aimed to investigate the effect of ultrasonication on broiler Natural Actomyosin (NAM), the principal structural complex of myofibrillar proteins. The main objective was to compare its behavior with that of intact myofibrils, where endogenous proteases are reported to cause degradation of certain proteins. NAM was ultrasonicated in dissolved as well as suspended or partially diluted state for different time intervals over a duration of 30 min. The effect on physico-chemical characteristics was studied to monitor the fate of individual components of the NAM complex subsequent to ultrasonication. The solubility, turbidity and enzymatic property of actomyosin were chosen as the indices of characteristic changes. Whether NAM aging influences the selected parameters was also investigated.

The results of this study indicate that ultrasonication initially causes some dissociation of proteins present in actomyosin complex. Prolonged sonication appears to bring about conformational changes leading to low-ionic-strength solubilization of the proteins of NAM complex that in control were soluble at high ionic strength. At the frequency (20 KHz) applied in this study, various proteins associated with this complex are not fragmented or denatured in fresh NAM samples. The enzymatic activity of fresh actomyosin complex decreases with ultrasonication, but the solubility/insolubility of the complex is also important determinant. The solubility increases up to 10 min of ultrasonication after that it remains constant. Turbidity also decreases with ultrasonication showing an apparent dissociation or intra-molecular conformational changes of actomyosin complex. Cleavage of myosin, as evident by SDS-PAGE with remarkably increased solubility and inactivation of ATPase, occurs only in aged actomyosin. The response of fresh as well as aged NAM to ultrasonic
radiation depends upon the duration of exposure, frequency of sonication and state of solubility.