

Abstract

The goal of this study was to evaluate the physical quality of locally available pelleted feed of fish, shrimp, cattle and poultry and standardization of appropriate method to determine the pellet water stability. Physical quality analysis of pelleted feed is very critical due to direct loss of pelleted feed which occurs due to the formation of fines or dust during handling and transportation. Water stability of pellet is critical for shrimp feed to minimize fast disintegration and high nutrient leaching during feeding of shrimps. Pellet sinking velocity and pellet size are also essential physical quality parameters of a feed.

Feed physical quality parameters such as Pellet Durability Index (PDI), water stability of pellets (as dry matter loss percentage), sinking velocity (ms^{-1}) and pellet size (length and diameter in mm) were determined using Holmen Pellet Tester, Water Stability Tester, Sinking Property Tester and Digital Caliper respectively. Cattle pelleted feed had lowest PDI (48.83 ± 1.76) while all other pelleted feed showed higher PDI values (more than 85 PDI, pellet diameter range between 3-12 mm). Also cattle pelleted feed had comparatively higher moisture percentage (13.97 ± 0.04) and pellet length about 10.00 ± 0.00 mm than other feed. Fish pelleted feed were floating feed while shrimp pellets were sinking. Shrimp pelleted feed with length 4.23 mm had highest sinking velocity ($0.097 \pm 0.00 \text{ ms}^{-1}$) while shrimp larval feed had lowest ($0.053 \pm 0.00 \text{ ms}^{-1}$). To standardize a method to determine the water stability of pellets, static method where zero cycles per minutes with no aeration, aeration only and water movement with vertical shaking (0.04 cycles per minute with aeration) were used in this study.

In conclusion, Water movement (vertical shaking with 0.04 cycles per minutes) with aeration for 20 minutes was the precise method than static and aeration only method. Also there were variations of physical quality of locally available pelleted feed.

Key words

Pelleted feed, Pellet Durability Index, Physical quality, Water stability