Japanese pepper (*Zanthoxylum piperitum*) belongs to the Rutaceae (citrus and rue) family, and is distributed in Japan and the surroundings East Asia. In Japan, the young leaves and fruits of Japanese pepper has been widely used as spice. After fruits in particular becoming ripe and having dried, the pericarps are separated from the seeds and ground. This ground pericarp is commonly used as the spice “sansho powder”, which is considered to enhance not only the flavor but also the digestion. Also, the Japanese pepper is one of the ingredients of herbal medicine, Daikencuto, which has been used as an antiflatulent. Regardless of the popularization of edible leaves and fruits, appreciable amount of the seeds become the unutilized agro-industrial by-product as waste. In Wakayama Prefecture that produces 70% of total yield of Japanese pepper in Japan, it has been searched to use the seed of Japanese pepper. The present study was therefore designed to investigate the effect of supplemental Japanese pepper seeds on performance, physiological parameters, and heat stress in broilers.