Degradation of tomato quality during transportation

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Tomato (*Lycopersicum esculentum*) is a delicate horticultural crop grown in many areas in Sri Lanka. Most of the tomato farms are situated away from main roads. Often tomato collecting trucks have to cross potholes, kerbs, bumps and even causeways. Vertical vibration acceleration experienced by tomatoes during transportation contributes towards increased post-harvest losses. It causes shortening of their shelf life. Objective of this study is to identify and estimate the key parameters leading to losses due to vibration at vehicular road transportation. A tri-axial accelerometer (Steval LIS 302 DL) has been used in this study to detect and record the vibration acceleration. Energy associated with the vibration was estimated in terms of the power spectral density (PSD). At poor road conditions (having higher IRI values) and at higher truck speeds the generated vertical vibration levels are higher and the resulting damages to the tomatoes are much severe. Results show that when the ratio sprung mass to unsprung mass, of the truck is smaller the vibration effects become much severe. Rear side of the truck always produced higher vibration levels compared to its front side. In addition, the vibration measurements made using the instrumented sphere (IS) reveal that the severity of the vibration level increased with the stacking height and the layering height of the commodity on the truck bed. Topmost tomato layer of the topmost tomato box experiences the greatest vibration acceleration. No significant modifications were observed in non-destructive firmness of tomatoes immediately after the vibration test. The estimation of the deterioration of tomatoes performed using the Equivalent Severe Bruise Index (EBI) method proposes that the higher the vibration level (higher the PSD), the more severe is the resulting damage. In order to meet the challenge of minimization of the transport losses, it is vital to identify the influence of the elements of the road-vehicle-load system