

Title Levels of Microbial Contaminants in Highbush Blueberries before, during and after Processing
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Abstract

Concerns regarding blueberry spoilage, safety and development of microbiological standards prompted a 2003 – 2004 survey in which highbush blueberries were collected from 18 different Michigan fields before harvest and quantitatively examined for mesophilic aerobic bacteria (MAB) coliforms, *Escherichia coli* and yeasts (Y) and molds (M). Thereafter, blueberries from these same fields were harvested and similarly assessed during processing (post-harvest, blower exit, after washing and at freezing) at four facilities along with environmental samples (blower and filler conveyor belts, chlorinated wash water). Duplicate blueberry (100 g), wash water (50 ml) and environmental swab samples (~10 x 10 cm) were analyzed for MAB, coliforms, *E. coli*, Y and M by plating on Typycase soy agar + 0.6% yeast extract, Petrifilm *E. coli*/coliform plates and potato dextrose agar containing streptomycin and ampicillin, respectively. Average counts on blueberries for MAB, Y and M were 3.53, 3.85 and 3.33 at pre-harvest, 5.01, 4.45, and 4.13 at post-harvest, and 4.23, 3.88 and 3.67 log CFU/g after washing, respectively. Coliform and *E. coli* counts increased 0.68 and 0.12 logs from pre-harvest to after washing, respectively. Microbial populations were highest on the blower and filler belts and lowest in the chlorinated wash water. Overall, microbial populations increased ~1.5 logs between harvest and processing (4 to 18 h) with the chlorinated wash (~10 to 200 ppm chlorine) reducing populations < 1 log. Thus, improved storage strategies before processing and more effective microbial reduction strategies during washing are needed to prolong the quality and shelf life of blueberries.