

Rapid Bioluminescence Detection of Bacteria in Cannabis-Infused Foods Using MicroSnap (TVC, EB, and Coliform)

Delia Calderon¹, Paul Meighan², Nicole Familiari¹
1: Hygiena, Camarillo, California, USA, 2: Hygiena International LTD., Guildford, Surrey, UK

Introduction:

Increasing use of Cannabis infused foods especially in countries and states where the consumption is legal, has led to a need for rapid testing

Purpose:

This study demonstrates a rapid bioluminescence microbiological method for the detection of TVC, Enterobacteriaceae and Coliforms.

Method:

Organisms were cultured in TSB and cannabis suspensions were prepared by adding 10mL water to 1g of cannabis product. Cultures were then diluted in the cannabis suspension or water. 1mL of the dilutions were added to the corresponding MicroSnap enrichment devices. These were incubated at the test method incubation temperature. Enriched samples were tested with the corresponding detection devices hourly after 5-8 hours.

Results:

Detection of target bacteria panel was determined by an RLU value greater than that of the threshold value. Thresholds were set using the background signal average and three times standard deviations. The lowest inoculum of the coliform panel were detected within the 8 hours at 37°C. The lowest inoculum for cannabis flower and edible, indicative of bacteria presence, was detected after just 5 and 6 hours. MicroSnap Coliform RLU thresholds were determined to be positive at >237 RLU, >250 RLU, >53 RLU and Edible >8 RLU.

Detection of EB bacterial panel at ≤10 CFU/mL in all tested flower strains occurred within the 8-hour incubation period and as early as the 5th hour. The lowest bacterial inoculum level of 10² CFU/mL in the cannabis edible was detected by the 6th hour. RLU thresholds for all strains were determined to be >2 RLU.

Detection of Aerobic bacterial panel at ≤10² cfu/mL was detected within the 8-hour incubation period for all three strains. The lowest bacterial concentration tested with edible was detected by the 7th hour of incubation. RLU thresholds were determined to be >8 RLU for strain 1 and >3 RLU for the other two strains and the edible

Significance:

The use of rapid microbiological methods can be successfully applied to the growing cannabis food industry



Coliform Panel Detection	Initial Inoculum (CFU/mL)	5h	6h	7h	8h
Strain 1	10 ³	+	+	+	+
	10 ²	+	+	+	+
Strain 2	10 ³	+	+	+	+
	10 ²	+	+	+	+
	10 ¹	+	+	+	+
	10 ⁰	+	+	+	+
Strain 3	10 ³	+	+	+	+
	10 ²	+	+	+	+
	10 ¹	+	+	+	+
	10 ⁰	+	+	+	+
Edible	10 ³	+	+	+	+
	10 ²	-	+	+	+



EB Panel Detection	Initial Inoculum (CFU/mL)	5h	6h	7h	8h
Strain 1	10 ³	+	+	+	+
	10 ²	+	+	+	+
	10 ¹	+	+	+	+
Strain 2	10 ²	+	+	+	+
	10 ¹	+	+	+	+
	10 ⁰	+	+	+	+
Strain 3	10 ²	+	+	+	+
	10 ¹	+	+	+	+
	10 ⁰	+	+	+	+
Edible	10 ³	+	+	+	+
	10 ²	-	+	+	+



TVC Panel Detection	Initial Inoculum CFU/mL	5h	6h	7h	8h
Strain 1	10 ³	+	+	+	+
	10 ²	+	+	+	+
Strain 2	10 ²	-	+	+	+
	10 ¹	-	-	+	+
	10 ⁰	-	-	-	-
Strain 3	10 ²	+	+	+	+
	10 ¹	-	-	+	+
	10 ⁰	-	-	-	-
Edible	10 ³	+	+	+	+
	10 ²	-	-	+	+