CLAIMS

What is claimed is:

1. A method for producing a comestible meat product, the method comprising:

flowing cells across one or more substrates disposed within an elongated bioreactor for a first period of time at an inoculation plug flow rate that displaces fluid within the elongated bioreactor in a direction in line with an inlet and an outlet of the elongated bioreactor while substantially reducing mixing of the cells with the fluid within the elongated bioreactor;

at least partially arresting flow of material through the elongated bioreactor for a second period of time to allow at least a portion of the cells to settle and adhere to the one or more substrates within the elongated bioreactor; and

circulating cell culture media from the inlet unobstructed to the one or more substrates and to the outlet of the elongated bioreactor for a third period of time at a progressively increasing flow rate to prevent shearing of the adhered cells from the one or more substrates while promoting growth of the adhered cells.

2. The method of claim 1, wherein flowing cells into the elongated bioreactor comprises filling the elongated bioreactor with cell culture media and displacing the cell culture media within the elongated bioreactor with cells, such that cell flow between the inlet and outlet comprises a uniform, substantially laminar flow.

3. The method of claim 2, further comprising flowing cells into an additional elongated bioreactor while at least partially arresting the flow of material through the elongated bioreactor.

4. The method of claim 1, further comprising:

in response to allowing the at least a portion of the cells to settle and adhere to the one or more substrates, rotating the one or more substrates about a longitudinal axis relative to the elongated bioreactor; and

allowing an additional portion of the cells to settle and adhere to one or more opposing surfaces of the one or more substrates within the elongated bioreactor by at least partially arresting flow of material through the elongated bioreactor for an additional period of time.

5. The method of claim 1, further comprising continuously rotating the one or more substrates about a longitudinal axis while at least partially arresting flow of material through the elongated bioreactor.

6. The method of claim 1, further comprising harvesting meat cells from the elongated bioreactor by flowing fluid through the elongated bioreactor at an elevated flow rate compared to a maximum flow rate of the progressively increasing flow rate, the elevated flow rate configured to separate the adhered cells from the one or more substrates.

7. The method of claim 6, further comprising cleaning the elongated bioreactor by flowing fluid through the elongated bioreactor at a further elevated flow rate configured to separate materials remaining on the one or more substrates after harvesting.