

CASE STUDY

Value Stream Analysis Cannabis Products Company

PROBLEM / CHALLENGE

The client is a vertically integrated Cannabis products company, operating manufacturing facilities, a supply chain including co-packers, a distribution center and retail stores.

After 10 years of entrepreneurial growth, the company's leadership faced various challenges including:

- Lack of understanding of true manufacturing and supply chain costs
- Retail channel stock-outs, at the same time the company was expanding to the wholesale and e-commerce channels
- Quality complaints from consumers

Value Stream Analysis

We assessed manufacturing and supply chain operations and prioritized lean supply chain improvement projects, starting with performance scorecards and value stream mapping.

To understand manufacturing and supply chain costs, we chose to do a value stream analysis, to determine total end-to-end costs from receipt of raw materials and packaging through shipping to retail stores and other channels.

The value stream analysis also identified and quantified waste streams in the process.

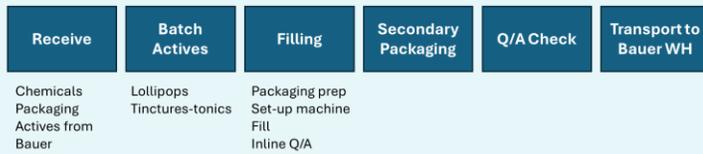
IMPLEMENTATION DETAILS

- Prioritized key focus areas based on a manufacturing and supply chain assessment**
 - Prioritized the development of costing data (labor, packaging and raw materials) to enable data-driven decisions
 - Recommended increasing visibility across raw materials, packaging, in-transit stock, and work-in-process to deal with the double-problem of excess inventory and store/warehouse stock-outs
- Mapped the Value Stream and created detailed list of sub-processes in in each major function**
 - See top of page 2 for Value Stream Flow
- Worked with the R&D, manufacturing and supply chain team to conduct time studies, quantify all costs and identify improvement opportunities for key product families**
 - Raw Materials, Packaging, Labor, Changeover, 1st Pass Yield, and Inventory
 - Identify processes contributing to waste in the end-to-end process
- Normalized all costs at the SKU level for 5 selected key products to a "cost per unit"**
 - The company makes products in many formats (liquid, gels, joints, gummies, etc.)



PRODUCTION VALUE STREAM FOR IN-HOUSE AND CO-MAN PROCESSES

This is the Value Stream Map for Internal Manufactured Product



This is the Value Stream Map for Co-Packer Manufactured Product Completion and Sending to Bauer to Warehouse



TEAM PURPOSE: The goal of the project was to create an optimized supply chain process for store / wholesale / ecommerce fulfillment that reduces waste, improves delivery accuracy, and minimizes all costs.

TIME STUDIES

Product Category	Material Prep	Mixing	Filling set-up	Filling	Package	Master Case
Kratom Capsules	1	11	39	17	26	n/a
Kratom Powder	2	11	40	18	n/a	n/a
Tinctures	3	12	41	19	27	34
Tonics	3	12	41	19	27	34
Puppperonis	4	13	n/a	20	28	n/a
Gummy-Caramel Packaging	5	n/a	n/a	n/a	29	35
Pain Cream + Balm	6	14	42	21	30	36
Lollipops	7	15	n/a	22	31	37
Joints (put 10 in ziplok)	8	n/a	n/a	n/a	32	n/a
Flower	9	n/a	n/a	23	33	36
Drink Infusers	10	n/a	43	24	n/a	38
Pain cream single cream	10	16	44	25	n/a	38

IDENTIFIED QUICK-FIX IMPROVEMENTS

#	Issue	Role	Idea/Solution
1.0	We master-case a lot of product (tinctures, tonics, lollipops, caramels, creams, honeysticks, balms) and this case is thrown away at the store. It is not used in display.	Packers	Eliminate master case boxes - master-case into undecorated boxes or ziplok bags.
2.0	Poured raw materials into drum but the batch was too small to mix in a drum	Chemical Operator	Batching instructions include quantity produced and the vessel needed for mixing.
3.0	3 trips to get water	Chemical Operator	Plastic measuring jug - up to 10000 ml
4.0	Went to candy room to get glycerin used in mixing room	Chemical Operator	Move raw materials closer to the mixing room (if it could fit)
5.0	Bug in mixing pail	Chemical Operator	Clean mixing vessel room.
5.1	Bug in mixing pail	Chemical Operator	First step of batch instructions - clean out pail or drum.
5.2	Bug in mixing pail	Chemical Operator	Pail holder
6.0	Walked to get drill for mixing	Chemical Operator	Store drill closer to or in mixing room
6.1	Walked to get drill for mixing	Chemical Operator	Eliminate drills, have a mixing station for pail mixing
7.0	Had to remove starwheel and clean surface to put on new starwheel.	Production Operator	At the end of each run, remove replaceable items and clean to prepare for the next run.
7.1	Had to remove starwheel and clean surface to put on new starwheel.	Production Operator	Schedule products that are similar sizes to run one-after-the-other to minimize equipment changes.
8.0	Production operator had to go to mix room to get tincture batch.	Production Operator	Batch brought over by Chemical Operator in a area labeled 'Next Batch'
9.0	Batch liquid has small splashes from fill hose into bottle, potentially causing bottle to get slippery and labels not to stick	Production Operator	Adjust the speed down to reduce spilling?
9.1	Batch liquid has small splashes from fill hose into bottle, potentially causing bottle to get slippery and labels not to stick	Production Operator	Replacement parts for items that get worn (example: filling arm)

QUANTIFIED FINISHED GOODS COSTS

	Product 1	Product 2	Product 3	Product 4	Product 6
Labor per Unit	\$0.18	\$0.21	\$0.15	\$0.45	negligible
Packaging per Unit	\$0.15	\$0.51	\$0.31	\$0.99	\$0.19
Active Yield 30%	\$0.15	\$0.06	\$0.70	\$1.40	\$1.93
Total =	\$0.49	\$0.79	\$1.16	\$2.84	\$2.12
Labor per Unit	\$0.18	\$0.21	\$0.15	\$0.45	negligible
Packaging per Unit	\$0.15	\$0.51	\$0.31	\$0.99	\$0.19
Active Yield 60%	\$0.08	\$0.03	\$0.35	\$0.70	\$0.97
Total =	\$0.41	\$0.75	\$0.81	\$2.14	\$1.15
Labor per Unit	\$0.18	\$0.21	\$0.15	\$0.45	negligible
Packaging per Unit	\$0.15	\$0.51	\$0.31	\$0.99	\$0.19
Active Yield 90%	\$0.05	\$0.02	\$0.23	\$0.47	\$0.64
Total =	\$0.39	\$0.74	\$0.70	\$1.91	\$0.83

TIME STUDY AND VALUE STREAM ANALYSIS

- **5 key products selected for production time study and select cost data analysis:** (a) Drink infuser, (b) Pain Cream, (c) Cannabinoid Candy (d) Cannabinoid Tincture (e) Cannabinoid beverage
- **Labor Time and Cost Analysis**
 - Material Prep Labor
 - Mixing Labor
 - Changeover-Filling Setup
 - Filling Labor
 - Packaging and Master Casing Labor
- **Packaging Analysis**
 - Packaging Material Costs Including excess packaging > 2 years of usage
 - Master Case cost (Master case was thrown away at retail when received)
- **High-Cost Raw Material Analysis - Yield**
 - Actual Cannabinoid costs per unit of product
 - Sensitivity analysis based on Cannabinoid mixing and filling yield

RESULTS

- **Data-Driven Approach to Improvements**
 - The most important result is a data-driven analysis of what and where the company should focus improvements to create a Lean Supply Chain
- **The Value Stream Analysis Identified Three Key Areas of Margin Improvement**
 1. High cost (\$4000 - \$5000 per Kg) Cannabinoid material/inventory is not accurately tracked through the process, with likely high yield losses
 2. Excess packaging – some products have 3 to 50 years of packaging on hand
 3. Manufacturing processes are not Lean (non-value-added work), causing significant labor inefficiency
- **Recommended Projects to Streamline Operations** – e.g., ERP implementation for data accuracy, forecasting and inventory optimization, quality management system development