PROFITING FROM BALANCING CUSTOMER WANTS WITH PROCESS PROFICIENCY

CASE STUDY – DISTRIBUTOR

This project was funded in part through *Growing Forward 2 (GF2)*, a federal-provincial-territorial initiative. The Agricultural Adaptation Council assists in the delivery of *GF2* in Ontario.

Key finding: utilizing straightforward process improvement tools potentially results in $1.2 million+ in savings, while simultaneously increasing sales.

The true cost of food waste can be considerably greater than a business quantifies it to be. One reason is that the "hidden factory"[1] of waste operating within a business can equate to 20 to 40 per cent of revenue.[2]

Businesses' profitability and competitiveness is negatively impacted when customers' and consumers' demands for quality and value are not met. Increasing sales without adequately considering supply chain implications can also impact businesses. Without such consideration, an increase in sales can lead to reductions in margins and profitability. This occurs when the functions within a business (e.g. procurement, sales and logistics) do not communicate or interact effectively.[3]

The need to balance demand and supply considerations is particularly acute for distributors, where slim margins can be eroded quickly by inefficient operations and waste. The cumulative impact of seemingly minor inefficiencies at multiple points along a business's operations (created by placing customer needs ahead of business needs) impacts the business's ability to supply customers with the right products at the right quality, on time, every time. Rebalancing customer expectations with operational considerations provides distributors with the ability to differentiate themselves in a competitive market, which is defined by unprecedented demand for freshness, convenience and value.

As part of the Ontario Produce Marketing Association's (OPMA) food waste reduction initiative, Value Chain Management International (VCMI) worked with a main line distributor ("the distributor") to augment their ongoing successful food waste[4] reduction efforts. Insights from the project are enabling the distributor to work more closely with local staff, customers, vendors and corporate colleagues, to introduce processes and the infrastructure required to implement continual improvement plans in produce, other food categories, and potentially their non-food business.

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[1] Activities that reduce the quality or efficiency of a manufacturing operation or business process, but are not initially known to managers or others seeking to improve the process. (Wikipedia definition)

[2] For example, see VCMI 2012 and VCMI 2014

[3] For example, see VCMI 2014 report and HBR article

[4] Commonly known as "shrink"

Determinants of Profitability

Three inter-related factors determine businesses' ability to profit from the sourcing and distribution of food, including produce:

1. Voice of the customer
2. Voice of the process
3. Voice of the business

Voice of the customer: This determines product and service-related attributes and experiences that determine customers' perceived value and loyalty felt towards competing products and suppliers. This type of information is typically gathered from personal communications and surveys.[5]

Voice of the process: This defines what a process (or series of processes) is capable of achieving versus what it was designed to achieve, and the relative impact of identified factors on process performance. This information is produced by gathering then analyzing continuous measurable data on the extent to which processes are under control.[6]

Voice of the business: This delineates the extent to which business operations meet the financial and strategic needs of the business and wider stakeholders. This information is presented at monthly management review meetings.[7]

Placing too much emphasis on the voice of the customer, without considering the voice of the process and the voice of the business, can lead to losses overall. Consumers' needs are met, but businesses don't gain any actual profit from the transaction. This not only impacts financial performance, but also results in waste. For an illustration of how these three inter-related factors can be monitored and managed by implementing a continual improvement programme, see Cut Waste, GROW PROFIT™.

Responding to Market Dynamics

Sales of packaged pre-prepared salads have grown exponentially, driven by the dual influences of 1) increasing demand amongst consumers for healthy, enjoyable eating experiences; and 2) increasing demand amongst foodservice establishments for convenient, high-quality items that are easy to prepare and serve. These same factors have led to an expanding array of items containing different combinations of lettuce varieties and accompanying ingredients. Challenges inherent with an expanded range of competing products include 1) a decrease in the volumes represented by individual items as a share of the overall market, 2) an increase in the costs and complexities of distribution, and 3) the cost of waste representing a greater percentage of margin compared to fast

[5] For expanded explanation see: https://www.isixsigma.com/dictionary/voice-of-the-customer-voc/
[6] For expanded explanation see: https://www.isixsigma.com/dictionary/voice-of-the-process-vop/
[7] For expanded explanation see: https://www.isixsigma.com/dictionary/voice-of-the-business-vob/

moving products sold in high volumes.[8] This dichotomy of factors can negatively impact businesses' performance — particularly given the slim margins that typify the food industry.

To counter this challenge, businesses must possess the ability to respond to customer demands, while maintaining cost effective and efficient operations. This may mean managing the range of products and service options offered to some or all customers more effectively.

Shrink Data Analysis

In 2016, the distributor experienced almost $1.2 million in shrink and associated waste in the produce category. Associated waste includes the transactional costs of managing the processes created by shrink. Analysis of 2016 shrink data identified pre-packaged leafy greens as a comparatively high source of shrink (29% by value). Presented in Table 1 is a subsequent analysis of shrink caused by leafy green items reaching their "best if used by" (BIUB) date. The analysis identified the top five incidents of shrink in leafy green SKUs due to reaching BIUB dates – by frequency, total number and value.

Table 1: Top 5 Leafy Green Shrink Items by Frequency, Volume and Value

TOP 5 BY FREQUENCY

Rank	Description	# of Cases Gone to Shrink	# of Times It Went to Shrink
1	4 x LETTUCE MIX	-148	36
2	2 x SPRING MIX ORGANIC	-95	30
3	4 x LETTUCE BLEND CHOPPED	-93	29
4	4 x ICEBERG LETTUCE CHOPPED	-111	12
5	4 x LETTUCE ROMAINE BLEND	-34	9

TOP 5 BY NUMBER OF CASES

Rank	Description	# of Cases Gone to Shrink	# of Times It Went to Shrink
1	2 x ARUGULA BABY ORGANIC	-276	11
2	4x SALAD BLEND	-185	7
3	4 x LETTUCE MIX	-148	36
4	4 x ICEBERG LETTUCE CHOPPED	-111	12
5	2 x SPRING MIX ORGANIC	-95	30

[8] Of the grocery SKUs distributed, 80 items were identified as having sales of five or less units per week.

TOP 5 BY DOLLAR AMOUNT

Rank	Description	# of Cases Gone to Shrink	# of Times It Went to Shrink
1	4 x SALAD BLEND	-185	7
2	4 x LETTUCE BLEND	-148	36
3	4 x ICEBERG LETTUCE CHOPPED	-111	12
4	4 x LETTUCE BLEND CHOPPED	-93	29
5	4 x KALE BLEND	-108	8

Subsequent analysis of shrink data for leafy greens identified that five SKUs were duplicated on the distributor's procurement and inventory management system. This was because they were listed under separate codes.

Associated Wastes

Food waste never occurs in isolation. Additional wastes associated with the loss of food include wasted energy, packaging, labour, infrastructure, transportation and transaction costs. If a distributer operates at an average margin of 20 per cent, it must sell four items to simply break even on every item lost.[9] Shrink, therefore, should be considered a symptom of ineffective processes and procedures; addressing the root causes of these symptoms provides businesses with the opportunity to measurably improve performance.

The distributor's food waste team identified over 20 potential wastes associated with shrink (see Table 2). Items such as number six (communication) are an aggregation of multiple activities. This illustrates why the true cost of food waste is considerably more than face value, due to the "hidden factory" scenario mentioned in the opening paragraph of this report.

[9] See VCMI 2014 report for details on the rationale behind this statement.

Table 2: Costs Associated with Food Waste

1. Food item
2. Lost revenue
3. Receiving returns
4. Removing from inventory management system
5. Auditing/recording
6. Communication: emails/meetings/telephone calls
7. Ordering replacement
8. Receiving replacement
9. Issuing customer credits
10. Processing customer credits
11. Reconciling customer accounts
12. Claiming vendor credits
13. Reconciling vendor accounts
14. Warehouse operations
15. Reconciling inventory management and sales management IT systems
16. Disposal transport
17. Disposal fee
18. Donation segregation/handling
19. Re-delivery (couriers and special deliveries)
20. Flagging products each day of five days prior to use by or best before date
21. Customer dissatisfaction, potential loss of future lost sales

The factors listed above result in the true cost of waste being a multiplier – often a significant multiplier – of a food item's face value. This is in addition to the cost of the product itself.

An estimation of transaction costs associated with shrink was based on the 18 labour-related costs listed above. If each action took five minutes to complete by employees earning on average $40 per hour, the additional costs associated with each carton going to waste would be $60 (5 minutes x 18 = 90 minutes @ $40/hour). This is equivalent to 14 full-time employees conducting non-value-added work for a year. Reducing shrink would allow those same people to perform value-added work, potentially leading to increased sales.

Project Charter

The remainder of the project focused squarely on reducing shrink in processed leafy greens, the purpose being to create capabilities that could be replicated across other items and commodities.

The first stage in the process was to determine the undesirable effects (UDEs) associated with shrink in leafy greens, which the project sought to address. Specific undesirable affects that the internal team (who worked with VCMI) associated with shrink forms the Appendix. To ensure the team agreed on the scope of effort, targeted improvements and how progress would be monitored, the project charter presented below in Table 3 was developed as a group. Targeted improvements for the leafy green category were a 50 per cent reduction in incidents of items reaching their BIUB

date and a 50 per cent reduction in the number of cartons going to shrink, due to having reached their BIUB date.

Table 3: Project Charter (Processed Leafy Greens)

<table>
<tr><td colspan="2">CURRENT UNDESIRABLE EFFECTS (UDEs)
Inconsistent quality
Increased costs per case. Costs incurred include
the produce item
handling returns/rejections
labour
disposal/donation
replacement process, including additional transportation
Strained, unconstructive internal relationships and apportioning of blame among employees
Dissatisfaction amongst external customers, impacting customer loyalty/future sales
Disconnects between procurement, inventory management, warehouse management and delivery routing systems</td></tr>
<tr><td colspan="2">PROBLEM STATEMENT
Too much reactive noise masking root causes of shrink in processed leafy green SKUs. The current situation leads to dissatisfaction and potentially unconstructive relationships developing with internal and external customers.</td></tr>
<tr><td colspan="2">OBJECTIVE
Measurably reduce level of shrink caused by processed leafy green SKUs reaching their BIUB date.

Produce insights, skills and processes that can be replicated to reduce shrink in other categories of foods and goods distributed.</td></tr>
<tr><td colspan="2">SCOPE
Top five processed leafy green SKUs experiencing shrink due to reaching BIUB date</td></tr>
<tr><td>PROCESS OUTPUT MEASURE (for chosen SKUs)
Donations to food banks: %, #
Credits: %, #, $
BIUB incidents and cartons: %, #
BIUB shrink: %, #, $
BIUB shrink as % of sales/revenue</td><td>POTENTIAL $AVINGS
Reduce frequency of BIUB incidents by 50%
Reduce total number of cases going to shrink due to BIUB incidents by 50%</td></tr>
</table>

Process Map

Completion of the project charter provided valuable clarity about the project purpose and intended outcomes. The next step was to map out processes involved in the sourcing, marketing and distribution of leafy greens. The purpose of this exercise was to understand how the processes associated with the problem statement contained in the project charter currently operate; and, in

so doing, identify waste or non-value-added activities that may cause problems that result in shrink or other wastes.

The mapping process began by the VCMI team "walking" the warehouse and speaking with staff. Observing current operations first hand provided the team with a deeper understanding of issues, such as discrepancies between how processes should be performed and how they were being performed. VCMI was able to identify the root causes of problems experienced by the distributor by contrasting the experiences and perspectives of those involved in different functions (e.g. sales, procurement, category management, warehouse operations, distribution and finance).

Inefficiencies associated with specific activities identified during the mapping process were acknowledged using the acronym TIM WOOD:

- T = Unnecessary **T**ransportation
- I = Unnecessary **I**nventory – required as a result of buffering against defects or shrink
- M = Unnecessary **M**otion or **M**ovement by people and/or equipment
- W = Unnecessary **W**aiting or delays
- O^1 = **O**ver Producing – making or producing more than is required, which leads to **I**nventory
- O^2 = **O**ver Processing – making it better than it needs to be
- D = **D**efects of any kind

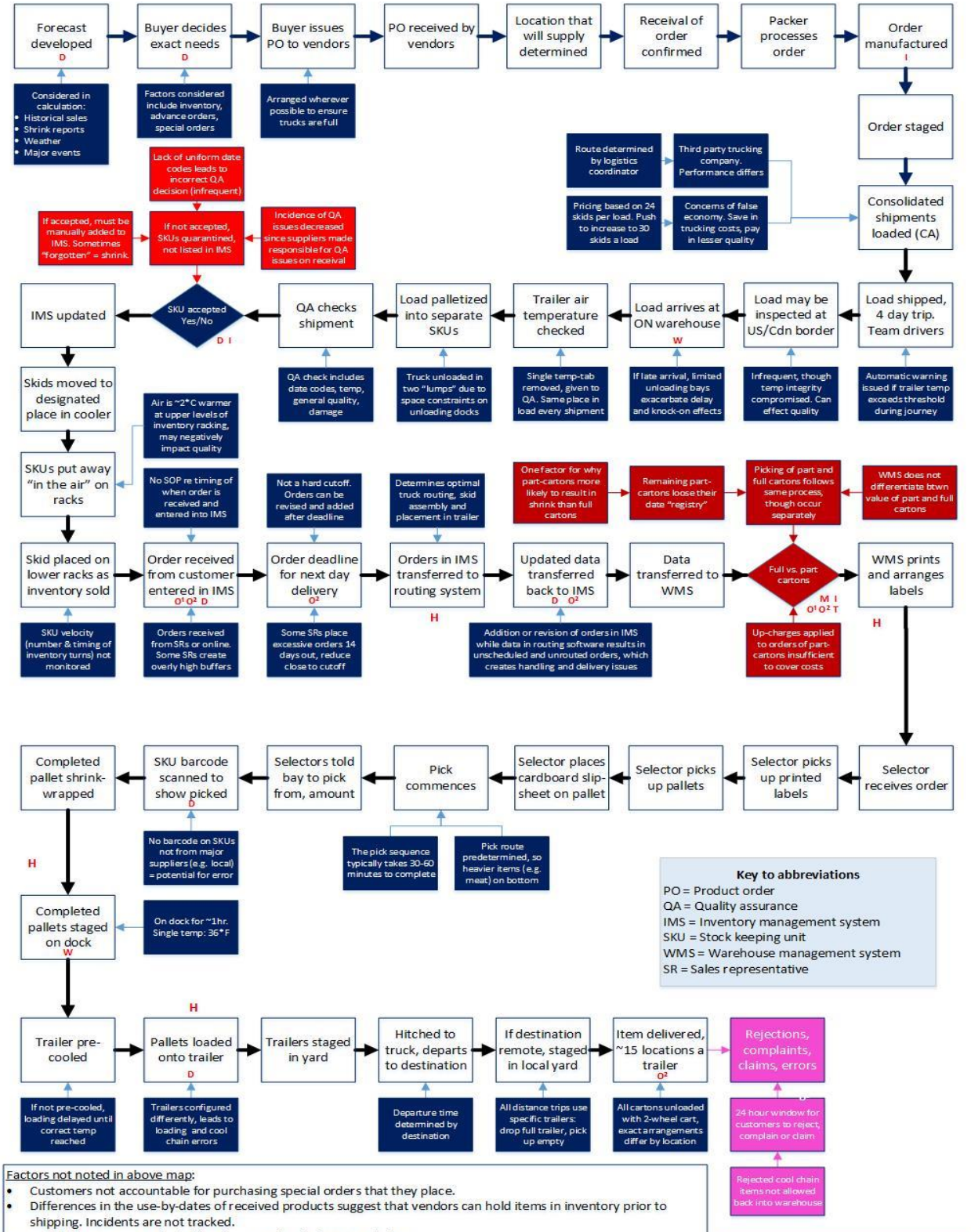
The process map presented below in Figure 1 is a schematic representation of the chain of activities occurring during the sourcing, marketing and distribution of leafy greens. The activities identified include marketing, development of orders, receival of produce, warehouse operations (including put-away of received skids into inventory racks followed by the pick -> pack -> ship of individual cartons/items), and the delivery of products to customers across Ontario.

Incidences of where TIM WOOD inefficiencies were identified as occurring are layered on the map, along with comments pertaining to factors impacting how each of the activities are performed. The "H" markers denote hotspots where labour inefficiencies can occur, which have the potential to exacerbate the occurrence of food waste in the warehouse or during its distribution to customers. Examples of this include warehouse employees not following standard operating procedures, such as covering skids with plastic surround wrap or sheeting prior to staging and loading onto trailers.

The map illustrates that multiple transactions that do not add any value are getting in the way of serving customers. Over processing of transactional information, combined with the overproduction of products and formats, leads to inventory issues and delays. Efforts are placed on minimizing transport costs, without fully considering the wider implications on performance.

Additional factors associated with the creation of unnecessary food and associated wastes, and identified during the mapping process, are summarized at the bottom of the process map.

Figure 1: Leafy Green Process Map



Mapped in red are two areas of activity where considerable chance exists for inefficient processes to arise, resulting in shrink and associated wastes. The first is the quarantining of deliveries received at the warehouse. This process is performed manually. Reasons for quarantining include products being mistakenly identified as possessing an unacceptably short shelf life, perhaps due to the lack of standardized date codes. If a previously quarantined product is accepted after reviewing quality or food safety concerns with vendors, it must then be manually monitored and entered into the inventory management system. For products that are rejected, their disposal and the subsequent claiming of credit from vendors is also a manual process.

The second and more serious cause of potential inefficiency and waste is the sale of part cartons. The picking, packaging and staging of part cartons is conducted separately to the pick, pack and staging of full cartons. The monitoring of part cartons' shelf life is a manual process. Part cartons are sold less frequently than full cartons. All these factors inherently increase the potential for products to reach their BIUB date and become shrink. These same inefficiencies occur in the absence of shrink, underlining why businesses should view shrink as a symptom, not a finite issue.

The incidences of carton splitting is exacerbated by the fact that 1) sales representatives (SRs) are able to override the surcharges that should be applied to the sale of part cartons, and 2) once an option is granted to one customer, it is offered to all customers. This further increases the potential negative impacts of seeking to delight customers by offering the option of part cartons. These factors stem from the splitting of cartons being driven more by sales than operational considerations: the cost of which creates hidden inefficiencies that are not included in the $1.2 million described on page three.

A common theme that emerged from the process mapping exercise was the lack of, or not adhering to, standard operating procedures and control points. An example of the impact of this on operational effectiveness and efficiency is employees not adhering to a set cut-off time for accepting next-day orders. Orders can be submitted directly by customers or via one of the distributor's SRs. Orders not entered into the inventory management system (at the time when data is transferred to the software program that determines the optimum delivery route, skid assembly and placement in trailer) must be reconciled manually. Subsequently, this can create problems during the loading of trailers and deliveries to customers.

Other work practices engendered by the present system include SRs becoming reliant on buffers. Excess orders are entered into the inventory management system well ahead of time – then modified shortly before the daily cut-off time. This practice impacts the procurement and inventory management process, resulting in excess inventory.

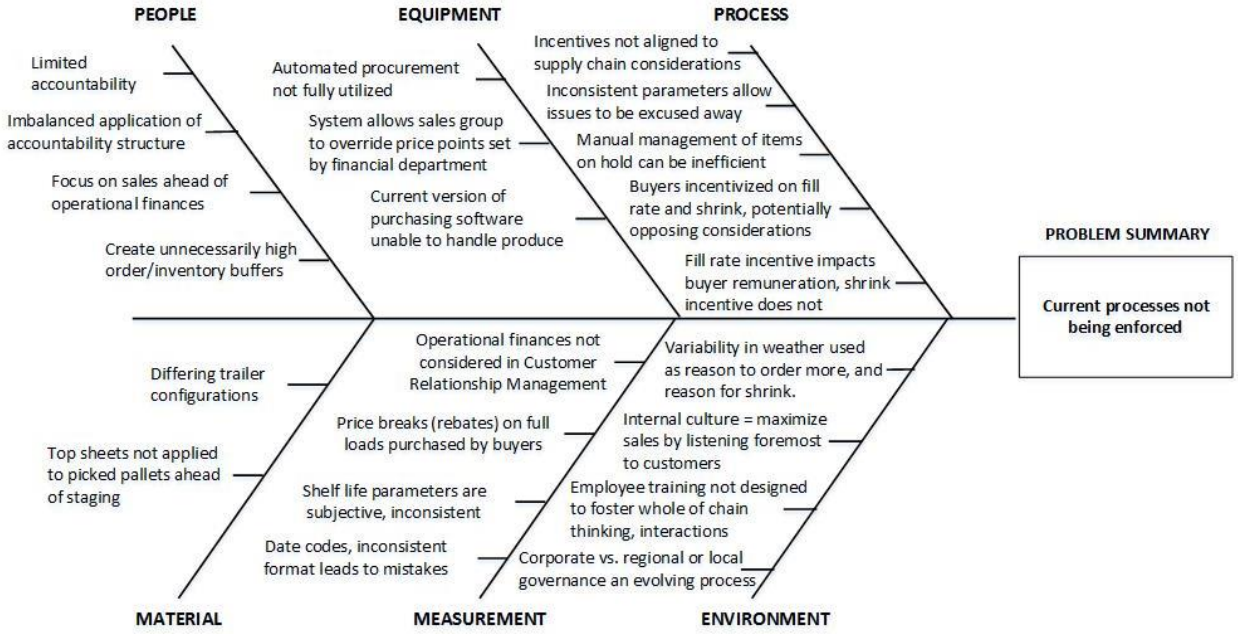
Root Causes

Seeking to delight customers by not enforcing adherence to current processes and standard operating procedures results in the over-processing of ordering, picking, packing and shipping practices.

A cause and effect analysis was conducted to identify causal relationships that, if addressed, would produce measurable improvements in the distributor's performance. Cause and effect analysis is also a valuable means of identifying root causes that require further investigation.

Presented below in Figure 2 is the cause and effect analysis conducted with the distributor's internal food waste team, to identify why current processes are not being enforced.

Figure 2: Cause and Effects



The analysis identified that the primary root causes of issues negatively impacting performance are suboptimal processes, accountability and reporting practices. This is due to some current processes being determined by subjective considerations that are difficult to verify or audit, and incentive systems that operate in isolation of wider supply chain considerations.

Further potential causes of waste include attempting to minimize transport costs by ensuring that all trucks are completely full, even if this means the transportation of items that are not required and that have a relatively long shelf life (e.g. citrus). Maximizing haulage capacity without sufficient consideration to temperature or potential interactions between produce type (e.g. ethylene producing vs. ethylene sensitive), and holding excess stock in the warehouse – limiting the availability of optimum storage space for perishable items – are both potential drivers of waste.

The unnecessary complexity that results from the current situation impacts business performance. The present situation also forces managers to repeatedly address issues that are symptoms of underlying problems.

The introduction of clear, objective, cross-functional accountability systems would address the current UDEs created by the dynamics that presently exist between and within functional departments (see Appendix).

Developing Solutions

In conjunction with the distributor's food waste reduction team, ideas were developed for delivering practical and sustainable results. Categorized according to their potential impact and level of effort required to implement, the ideas proposed are presented below in Table 4.

Table 4: Ideas to Improve Performance

BIG REWARD / BIG EFFORT **DO LATER**	**BIG REWARD / LOW EFFORT** **DO NOW**
7. Educate SRs on supply chain considerations… 8. Review and revise SRs' incentive programs to ensure supply chain requirements enacted…	1. Restrict the splitting of cartons 2. Correct wrapping of skids on dock …. 3. Choose 6 items for auto-ordering trial… 4. No filling of inbound trucks with unrequired items… 5. Validate accuracy of shelf life parameters… 6. Bring in leafy greens 3 times a week, *instead of the current twice a week*…
LOW REWARD / BIG EFFORT **PARK**	**SOME REWARD / LOW EFFORT** **DO WHEN WE CAN**
9. Review buying geography and pick-up options… 10. SR performance tracked to assess relationships between order placing, forecasting and shrink…	

The top right quadrant contains six ideas that the distributor's team proposed to measurably reduce shrink, each of which require a low level of effort to implement and enforce. The revision of training and incentive systems, particularly for SRs, was considered too ambitious an undertaking as a first step. Therefore, they were categorized as "Do Later," even though they are expected to have a significant impact on performance. The remaining two ideas (review buying geography and introduce supply chain related monitoring of SRs' performance) were deemed of insufficient benefit and requiring too much effort to warrant their implementation.

Shown below in Table 5 is the action log used to monitor the implementation of the ideas listed above. Each item is described concisely, based on findings that emerged from the development of the process map and cause and effect diagram. Listed alongside each action item is an owner[10] (the person responsible for its completion), the date by when the activity is expected to be completed, and its current status.

Table 5: Action Log

Idea #	ACTION	OWNER	BY WHEN	STATUS
1	Restrict the splitting of cartons	Diane (purchasing)	July 12	Done
2	Correct wrapping of skids on dock	Kevin (warehouse)	July 12	Done
3	Choose 6 vendors/items for auto-ordering trial	Bill, Peter (warehouse/ purchasing)	Dec 31	On schedule
4	No filling of inbound trucks with unrequired items	Dan, Belinda (marketing)	Oct 31	Done
5	Validate accuracy of shelf life parameters	Diane, Belinda, Peter (purchasing/marketing/ warehouse)	Oct 31	Done
6	Bring in leafy greens in 3 times a week	Belinda, Dan (marketing)	Oct 31	Done
7a	Educate SRs on supply chain considerations	TBD		
7b	Review and revise sales force incentive programs to ensure supply chain requirements enacted	TBD		
8	Distribute articles on supply chain incentives, demand amplification	Martin (VCMI)	July 13	Done
9	Review buying geography and pick-up options	Diane, Belinda, Peter, Bill (purchasing/ marketing/warehouse)	Oct 31	Done
10	SR performance tracked to assess relationships between order placing, forecasting and shrink	Parked		

The activity log is a living document, meaning that it will be updated regularly.

[10] For confidentiality purposes, the involved individuals have been anonymized.

Next Steps

Following are next steps for ensuring that the gains achieved so far translate into sustained improvements that can be replicated across the distributor's operations. The steps reflect elements of the "plan, do, check, act cycle,"[11] along with appropriate checks and balances.

- Define processes and establish process documentation
- Identify process risks and implement control points
- Ensure control points and process measures are reviewed at management meetings
- Establish schedule for regularly reviewing processes, with remediation where required
- Implement post implementation audits
- Ensure process measures are reviewed at monthly senior management meetings

Conclusion

VCMI's collaboration, on behalf of OPMA, with the mainline distributor is producing results. Where appropriate, letters from the acronym TIM WOOD are listed alongside. Results achieved to date include

- Deletion of duplicate items from the inventory management system (D);
- Restricting produce SKUs offered as split cartons (I, O^1, O^2);
- Data analysis opportunities, e.g. using the present system to monitor customer behaviour;
- Identifying immediate and longer-term opportunities to improve supply chain practices;
- Enforcing "quick wins," such as ensuring all skids are completely covered in plastic at staging (D); and
- Creation of skills, tools and techniques that are being replicated across the produce category and other categories of food – including dairy and grocery.

Method of Analysis

The study involved 1) reviewing the distributor's shrink data to identify waste hotspots by SKU; 2) walking the distributor's warehouse to observe operations; 3) custom data analysis to identify underperforming SKUs, estimate the true cost of waste, and compare the level of shrink occurring in leafy green SKUs; and 4) four facilitated meetings with key staff. The cross functional departments that actively participated in the study comprised:

- Purchasing
- Warehouse
- Marketing

[11] The Plan Do Check Act (PDCA) cycle provides a disciplined process of testing small, carefully designed changes, the impact of which is evaluated before the changes are rolled out across the company or more ambitious efforts are undertaken.

The activities described above enabled the distributor's packaged leafy green value chain to be mapped and data analyzed to measure performance, and causal relationships that impact operational performance to be investigated. The resulting insights showed the extent to which the distributor's performance is effected by misalignments in practices and processes, and how this can be addressed proactively by establishing measurable monitoring and reporting systems.

The project showed how a business can achieve effective solutions for improving performance by a) viewing the processes that together form a value chain, and b) analyzing continuous measurable data produced by current monitoring and management systems. It also confirmed the fact that sustaining improvements by balancing customer, process and business considerations relies on establishing cross-functional key performance indicators (KPIs) and supply chain orientated accountability systems that are enforceable.

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Appendix: Undesirable Effects Associated with Shrink in Leafy Greens