Pet Food Manufacturer

(Supply Planning)

Developed a Supply Planning model by evaluating the manufacturing processes, accounting for production capacity and bottlenecks, and recommend the production/supply schedule to meet future demand with greater accuracy

SUPPLY PLANNING FOR PE-OWNED PET FOOD MANUFACTURER

ABOUT THE CLIENT

Company is a PE-owned **pet food manufacturer** based in the U.S.

SITUATION

- Recently implemented **ERP system was not a good fit** for the company's business processes. Hence, the purchase orders generated from the system were not optimal, leading to frequent stock outs and low service levels

- Merilytics partnered with the company to **develop a supply planning model by evaluating the manufacturing processes, accounting for production capacity and bottlenecks, and recommend the production/supply schedule** to meet future demand with greater accuracy.
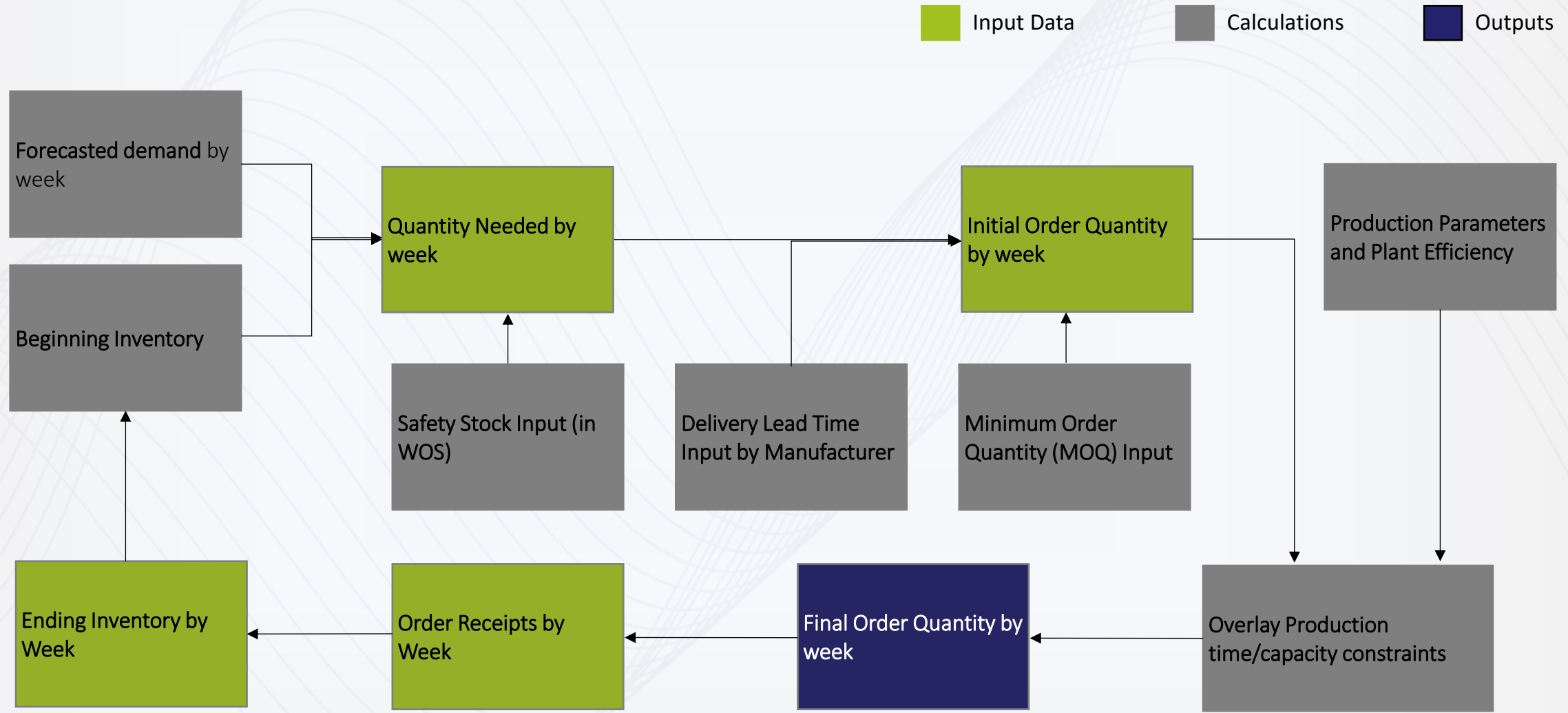
VALUE ADDITION

- Analyzed in-house manufacturing processes (grinding, bagging and extrusion) and identified production bottlenecks to **estimate required production hours** and **plan production at manufacturers effectively**

- Estimated **optimum order quantity** to meet forecasted demand taking into account minimum order quantity (MOQ) constraints, vendor delivery lead times, safety stock inputs and plant efficiencies

- Provided flexibility to **overlay production and order quantity** by week based on in-house and vendor capacity constraints and inventory levels

IMPACT

- Our comprehensive Supply model positively impacted their supply planning performance in **allowing the planner to factor in the constraints during the planning process and identifying key drivers of variation** in inventory and production, to generate POs for optimum inventory and service levels

OVERVIEW OF THE SUPPLY PLANNING CYCLE

Legend: Input Data | Calculations | Outputs

Forecasted demand by week

Beginning Inventory

Quantity Needed by week

Safety Stock Input (in WOS)

Delivery Lead Time Input by Manufacturer

Initial Order Quantity by week

Minimum Order Quantity (MOQ) Input

Production Parameters and Plant Efficiency

Ending Inventory by Week

Order Receipts by Week

Final Order Quantity by week

Overlay Production time/capacity constraints

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INPUT PRODUCTION PARAMETERS AND OVERLAY PRODUCTION

Input Production parameters		
Process	**Plant 1**	**Plant 2**
Grinding Production per hour (lbs)>>	15000	30000
Extrusion Production per hour(lbs)>	20000	10000
Bagging Prod. (#bags) - Small bags>>	1200	1,500
Bagging Prod. (#bags) - Medium bags>>	600	800
Bagging Prod. (#bags) - Large bags>>	500	500
Input Tolerance for production capacity (%)	1%	1%

Bagging Parameters		
Size		**Bags per Hour**
Small bags	0 - 5 lbs	1,500
Medium bags	5 - 20 lbs	720
Large bags	>20 lbs	800

Summary by Manufacturing Plant

Production Hours	4	5	6	7	8	9	10	11	12	13	14
Total Production Hours (based on manual overlay and bagging/extrusion constraint)	75.9	87.0	83.9	85.2	97.7	90.1	86.1	91.0	83.7	83.7	76.2
Plant Capacity (hrs.)	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0

Formula	Plant	S&OP Metric	4	5	6	7	8	9	10	11	12	13	14
Formula 1	Plant 1	Beginning Inventory (#units)	1,333	987	1,129	1,043	943	831	726	635	554	474	393
		Demand (#units)	135	245	104	275	95	171	72	110	211	296	224
		Quantity Needed (#units)	30	12	14	23	11	0	0	10	0	0	12
		Order Receipts (#units)	0	512	0	0	0	0	0	0	0	0	770
		Ending Inventory (#units)	987	1,129	1,043	943	831	726	635	554	474	393	1,074
		Weeks of Supply	5	7	7	8	6	4	3	3	3	3	10
		Initial Order Qty (#units)	203	0	0	0	0	0	0	0	0	12	0
		Final Order Qty (#units)	512	0	0	0	0	0	0	0	0	770	0
		Formula Order qty (lbs)	15,000	0	0	0	0	0	0	0	0	15,000	0
		Grinding (hours)	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07	0.00
		Extrusion (hours)	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00
		Bagging (hours)	3.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.08	0.00
		Total Production hrs	3.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.08	0.00
		Manual Overlay (hrs)		0.00	0.00	0.00	0.00						
Formula 2	Plant 2	Beginning Inventory (#units)	1,480	780	300	537	69	848	489	1,237	964	601	137
		Demand (#units)	139	62	129	127	283	239	261	262	144	141	189
		Quantity Needed (#units)	81	183	426	301	717	0	114	0	0	301	697
		Order Receipts (#units)	0	0	617	0	1,245	0	1,014	0	0	0	1,264
		Ending Inventory (#units)	780	300	537	69	848	489	1,237	964	601	137	990
		Weeks of Supply	5	2	2	0	4	2	7	4	2	0	2
		Initial Order Qty (#units)	183	426	301	717	0	114	0	0	301	697	19
		Final Order Qty (#units)	0	617	0	1,245	0	1,014	0	0	0	1,264	0
		Formula Order qty (lbs)	0	24,000	0	24,000	0	24,000	0	0	0	24,000	0
		Grinding (hours)	0.00	1.71	0.00	1.71	0.00	1.71	0.00	0.00	0.00	1.71	0.00
		Extrusion (hours)	0.00	2.00	0.00	2.00	0.00	2.00	0.00	0.00	0.00	2.00	0.00
		Bagging (hours)	0.00	2.97	0.00	1.88	0.00	2.29	0.00	0.00	0.00	1.82	0.00
		Total Production hrs	0.00	2.97	0.00	2.00	0.00	2.29	0.00	0.00	0.00	2.00	0.00
		Manual Overlay (hrs)	0.00	0.00		0.00	0.00		0.00			0.00	0.00

Summarize Production hours by week and flexibility to overlay production based on plant capacity for in-house production

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MANAGE ORDER QUANTITY FOR CO-PACK MANUFACTURERS

Input Co-Pack MOQ (#sellable units) by SKU		
Co-Pack Manufacturers	SKU	MOQ (#units)
Manufacturer 1	SKU 1	1,000
Manufacturer 1	SKU 2	1,500
Manufacturer 2	SKU 1	1,700

Input Co-Pack Container size (#sellable units)	
Co-Pack Manufacturers	Units
Manufacturer 1	5,000
Manufacturer 2	3,000
Manufacturer 3	4,000

Summarize Inventory position at various stages and overlay order quantity at a SKU level for co-pack manufacturers based on capacity constraints

Summary by Manufacturer - Weekly Planner by SKU

Manufacturer 1		4	5	6	7	8	9	10	11	12	13
Total Order Quantity		4	5	6	7	8	9	10	11	12	13
Total Order Quantity (#units)		6.0	15.0	15.0	5.0	3.0	11.0	5.0	8.0	9.0	9.0

SKU	S&OP Metric	4	5	6	7	8	9	10	11	12	13
SKU 1	Beginning Inventory	668	194	401	855	470	186	139	140	576	496
	Demand	552	583	582	847	713	1,078	592	566	528	799
	Quantity Needed	193	88	74	188	0	0	0	0	0	0
	Order Receipts	234	126	0	1,023	0	0	0	0	0	0
	Ending Inventory	41	38	-74	835	723	602	488	372	251	127
	Weeks of Supply	0	0	0	1	1	1	1	1	0	0
	Order Qty (units)	1,023	0	0	0	0	0	0	0	1,023	0
	Final Order Qty (lbs)	30,690	0	0	0	0	0	0	0	30,690	0
	Initial Order Quantity	1,023	0	0	0	0	0	0	0	1,023	0
	Manual Overlay>										
SKU 2	Beginning Inventory	58	159	586	215	591	674	1,028	516	725	1,121
	Demand	844	414	1,147	1,082	310	829	347	163	69	633
	Quantity Needed	575	120	139	254	0	0	211	0	0	260
	Order Receipts	800	300	200	1,023	0	0	1,023	0	0	1,023
	Ending Inventory	225	180	61	769	465	130	812	453	88	763
	Weeks of Supply	0	0	0	2	1	0	3	1	0	2
	Order Qty (units)	1,023	0	0	1,023	0	0	1,023	0	0	1,023
	Final Order Qty (lbs)	15,345	0	0	15,345	0	0	15,345	0	0	15,345
	Initial Order Quantity	1,023	0	0	1,023	0	0	1,023	0	0	1,023
	Manual Overlay>										