# Chapter 4 – Experimental Results (Beverage Sales, 47 SKUs)

We evaluate a multi-agent control tower on the Beverage Sales dataset. External signals excluded; ABC–XYZ segmentation; lead time=2 weeks. We compare Baseline and LangChain-powered PM modes.

## Table 1 – KPI Summary

|  |  |  |  |
| --- | --- | --- | --- |
| **Metric** | **Baseline** | **PM\_Lean** | **PM\_HighService** |
| **MAPE** | 0.2863 | 0.2862 | 0.2862 |
| **Fill Rate** | 0.962 | 0.9666 | 0.9682 |
| **Avg Inventory (units)** | 921.2686 | 972.0466 | 958.301 |
| **Turnover** | 1810.8969 | 1716.2988 | 1740.917 |
| **Stockout Weeks** | 35.0 | 34.0 | 36.0 |
| **Holding Cost** | 23461.4444 | 24526.9623 | 24207.9409 |
| **Ordering Cost** | 14600.0 | 14900.0 | 14800.0 |
| **Total Cost** | 38061.4444 | 39426.9623 | 39007.9409 |

## Table 2 – Segment Performance (PM High Service)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Segment** | **SKUs** | **Demand** | **Shipped** | **FillRate** | **AvgOnHand** | **StockoutWeeks** | **Orders** |
| **A-X** | 28 | 182483.0 | 177813.03 | 0.9744 | 1082.8323 | 20 | 102 |
| **B-X** | 12 | 46812.0 | 44921.0 | 0.9596 | 784.7056 | 9 | 31 |
| **C-X** | 7 | 27370.0 | 25758.0 | 0.9411 | 757.7679 | 7 | 15 |