



# Shelf life prediction model enhancement for domestic retail product

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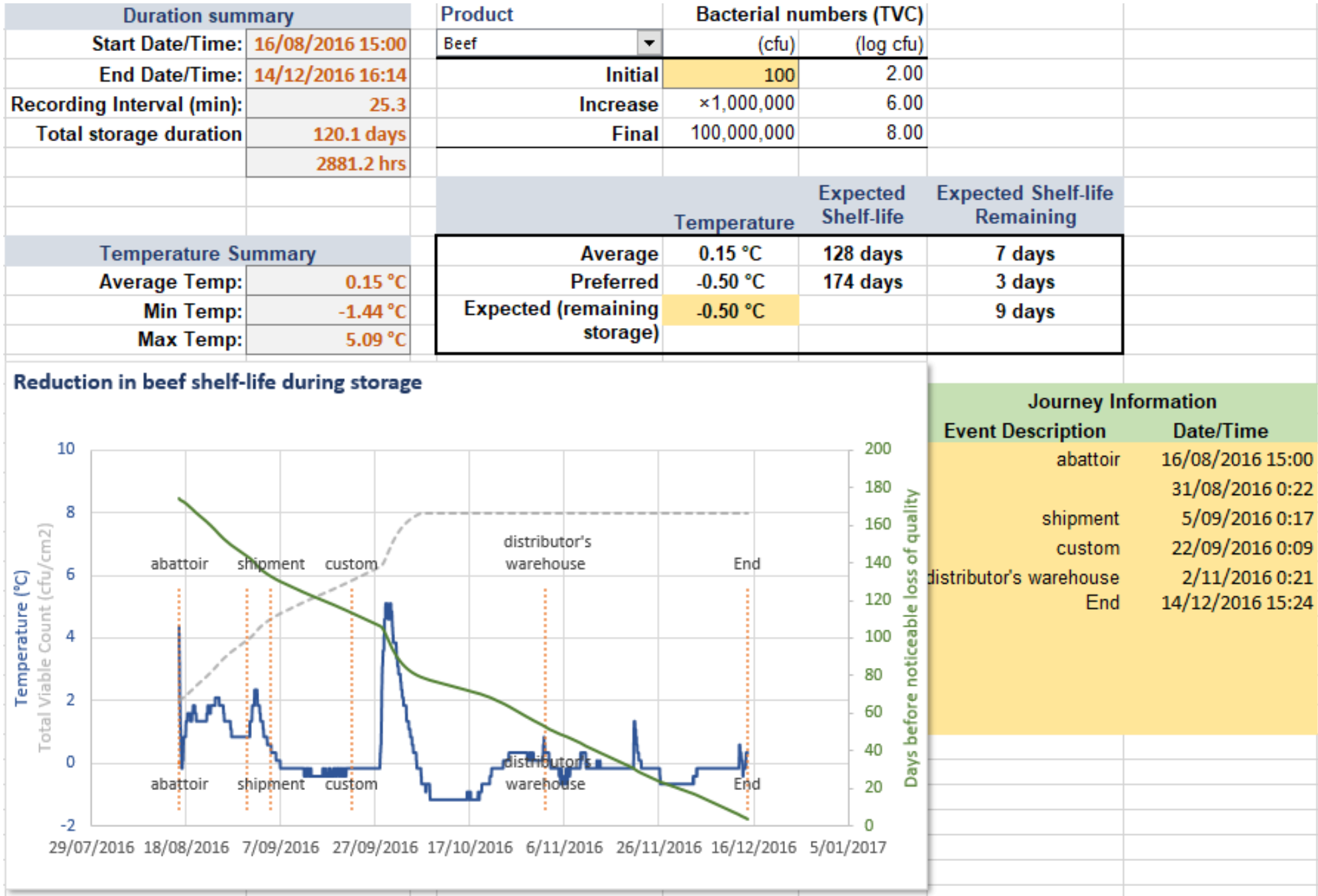
# Outline

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# Program background

- Model developed by University of Tasmania - experts at developing models
- The model predicts end of shelf-life for beef and lamb based on organoleptic assessment for on opening of vacuum pack (export market)





# Objective and opportunity of SL prediction

## Objective

- Shelf life validation by correlating microbial and organoleptic assessment
- Increase flexibility for primal processing window
- Verify the shelf life model for domestic supply chain

## Opportunity

- Reduce shelf life restriction on product
- Reduce micro testing and shelf life validation requirements
- Reduce customer complaints and waste



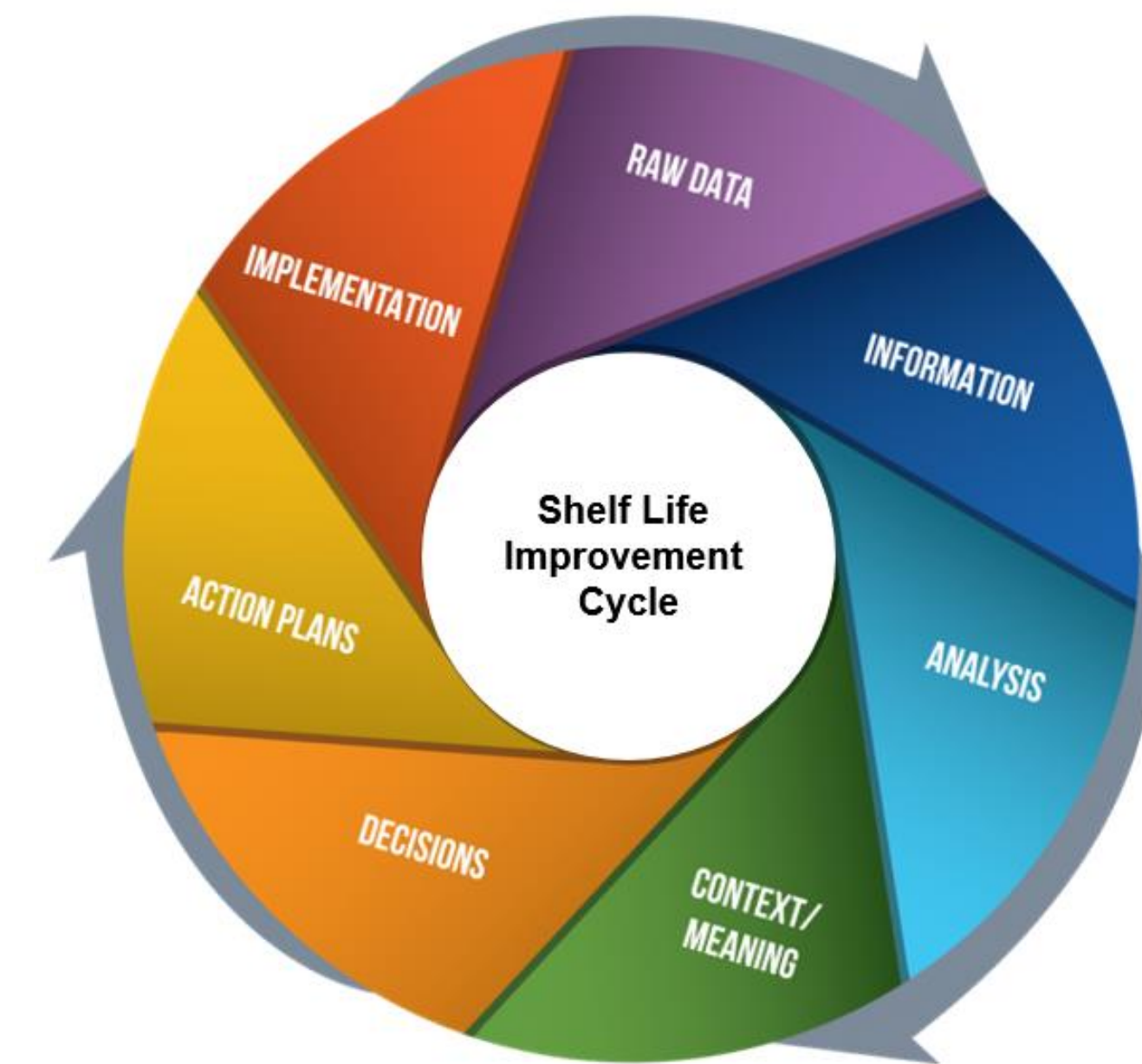
# Advantages and challenges of SL prediction for industry

## Advantages

- Reduce storage temperature by 2°C will gain 25% SL (VP)
- Micro is not the main criteria for SL determination
- Use organoleptic assessment for SL determination
- Scenario analysis for product (i.e truck break down)
- Use SL Model tool as part of SL validation assessment and decrease routine validation frequency and/or number of test
- Increase confidence in product through cold chain

## Challenges

- Implement real time data recoding to monitor supply chain (not retrospectively test):
  - Set baseline/benchmark
  - Allows a range of specifications (reduce or increase) use by dates based on cold chain and primal





# Validation of the SL model

- Verification of SL prediction accuracy is being undertaken  
is a staged process
- Stage one has been completed



# SL trial design

- Rump primal preferred due to colour instability
- VP rump roast – 5, 20 and 69 days ageing
- MAP rump steaks – VP rump primal 28, 34 and 69 days ageing, further processed into retail MAP pack
- Overwrap rump steaks - rump primal 40, 61 and 90 days ageing, processed into retail OW pack
- (Simulated) storage temperatures at:
  - Cold storage, Refrigerated truck, DC, Retail display, Consumer purchase, Domestic refrigerator
- Measurements and data collection (Time/temperature, pH, organoleptic & micro)





# SL trial results (VP)

## VP Rump roast

- Results from this trial show that VP rump roast can be aged for longer at low temperature and can still achieve a shelf life >35 days.

### Appearance of 64 days old VP beef rump roast





# SL trial results (MAP)

## MAP Rump steak

- 28 and 34 days old primals, MAP packed steaks were marginally acceptable up to 8 days,
- Ageing primals for 69 days reduced the shelf life to only 4 days.

28 days aged VP primal  
8 days MAP



34 days aged VP primal  
8 days MAP



69 days aged VP primal  
4 days MAP





# SL trial results (OW)

## OW rump steak

- After processing 40 and 61 days old primals OW packed steaks were acceptable up to 7 days
- 90 days old primals had 4 days with some marginal changes in odour and flavour

40 days aged VP primal  
7 days OW



61 days aged VP primal  
7 days OW

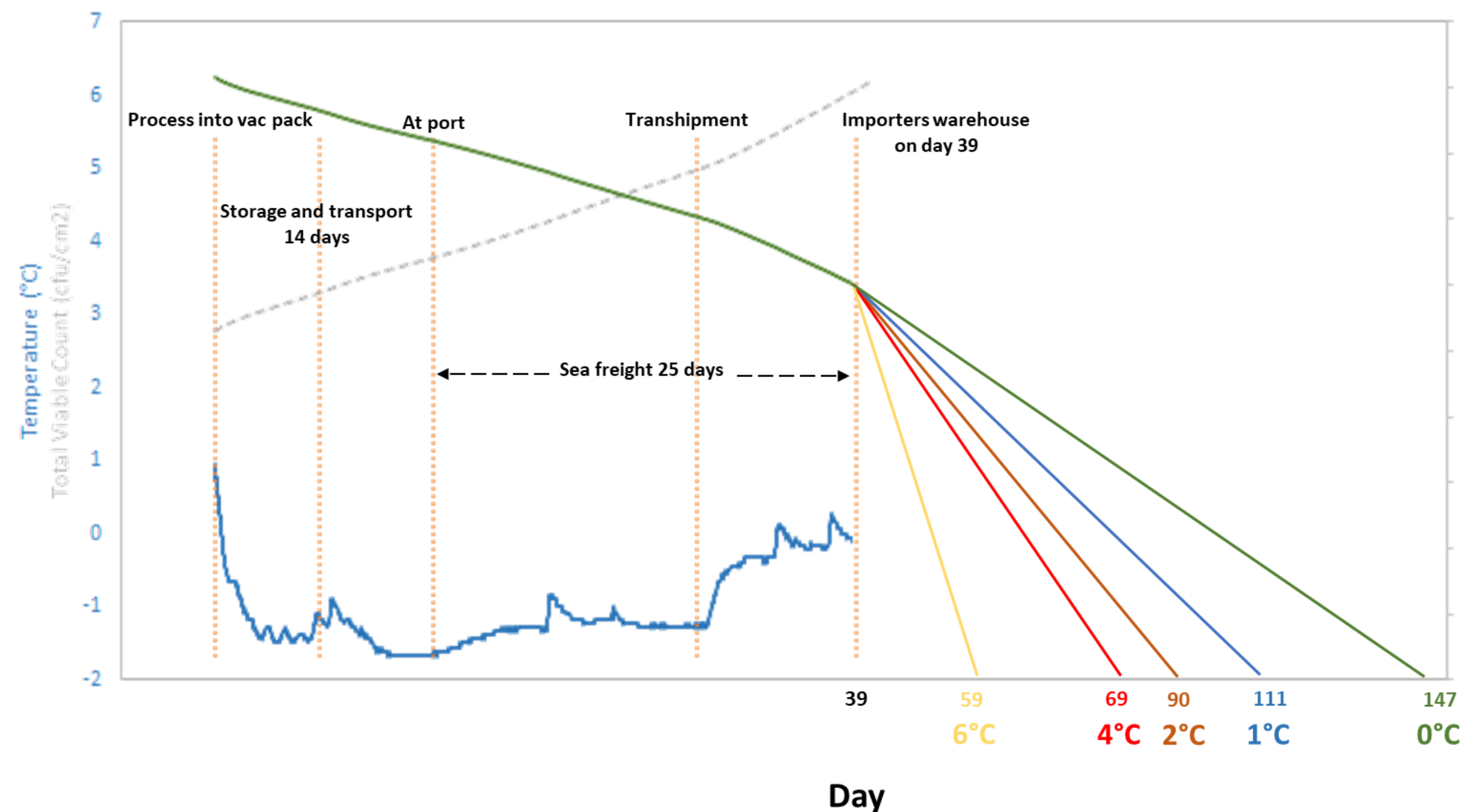


90 days aged VP primal  
4 days OW





# Critical elements of SL management



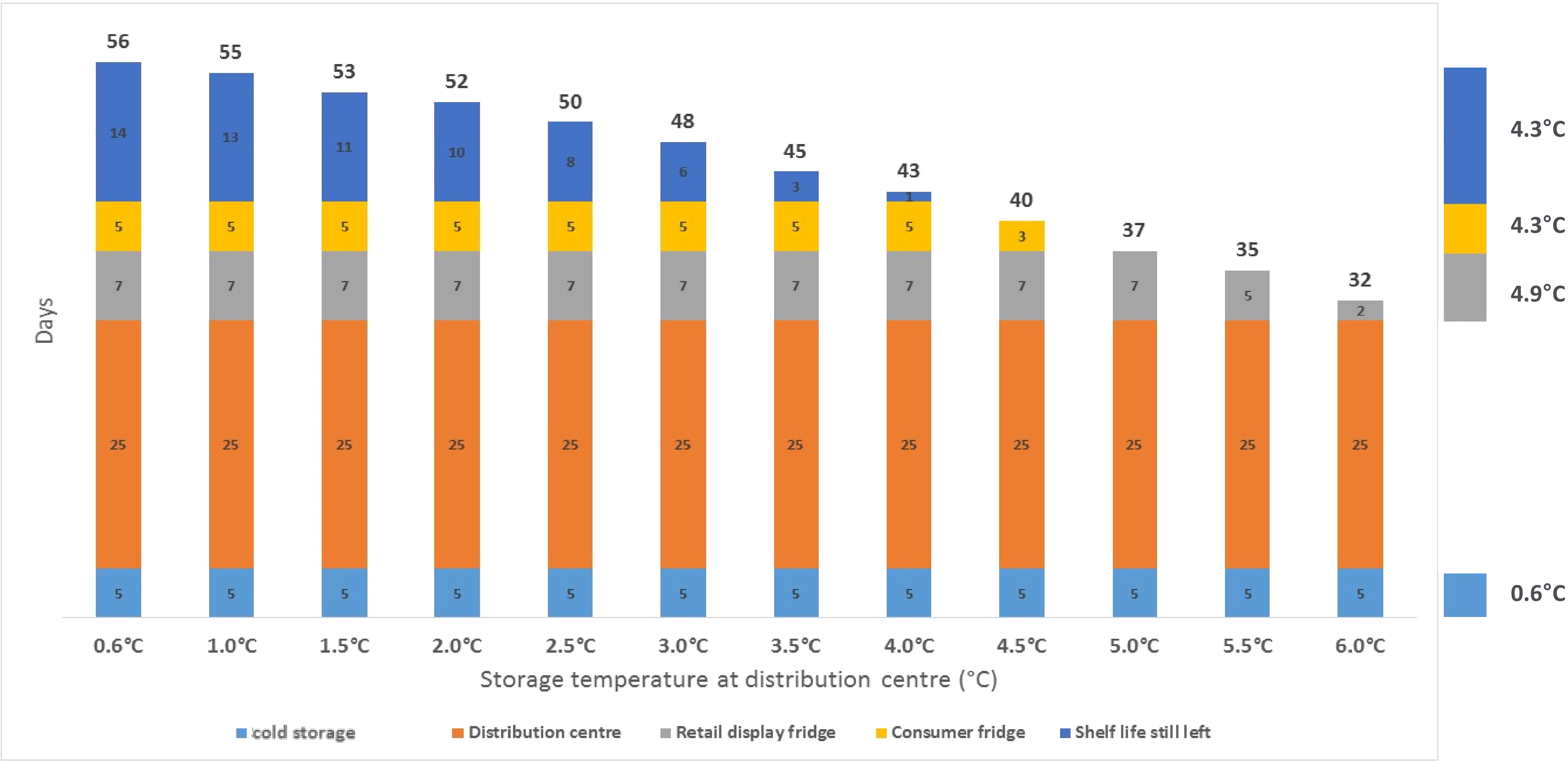
Days before noticeable loss of quality

Temperature  
Temperature  
Temperature!





# Controls and mechanisms for longer shelf life



(5 days at cold store, and 25 days at DC)



# Findings and outcomes of SL trial

- Could extend processing window for retail pack from 29d to 35d
- Could extend useby of retail roast from 35 to 42d
- Re-evaluate the basis for setting the primal processing window
- Review storage time at each segment in supply chain and the impacts
- Reduce micro testing and product annual testing
- Organoleptic main criteria for SL determination



# Benefits and recommendations

## Loss opportunity:

- Decrease value of primal by **60%** from short processing window
- Less markdowns /increase shelf life for fresh beef
- Less product testing (~ \$5 - 8k/sku/SL test)

## Benefits with complicated or undefined value:

- Stock control and management decisions not limited to micro testing
- Scenario mapping ( what ifs ) to allow for agile decision





# Next steps (stage 2)

Validate other packaging formats:

- VSP (underway)
- Thermoform (Planned)
- Form shrink (Planned)
- Export (VP, retail formats)
- Model validation for lamb





# Questions

