

Evaluating the effectiveness of a postbiotic product to reduce *Salmonella* prevalence in the subiliac lymph nodes of cull dairy cattle

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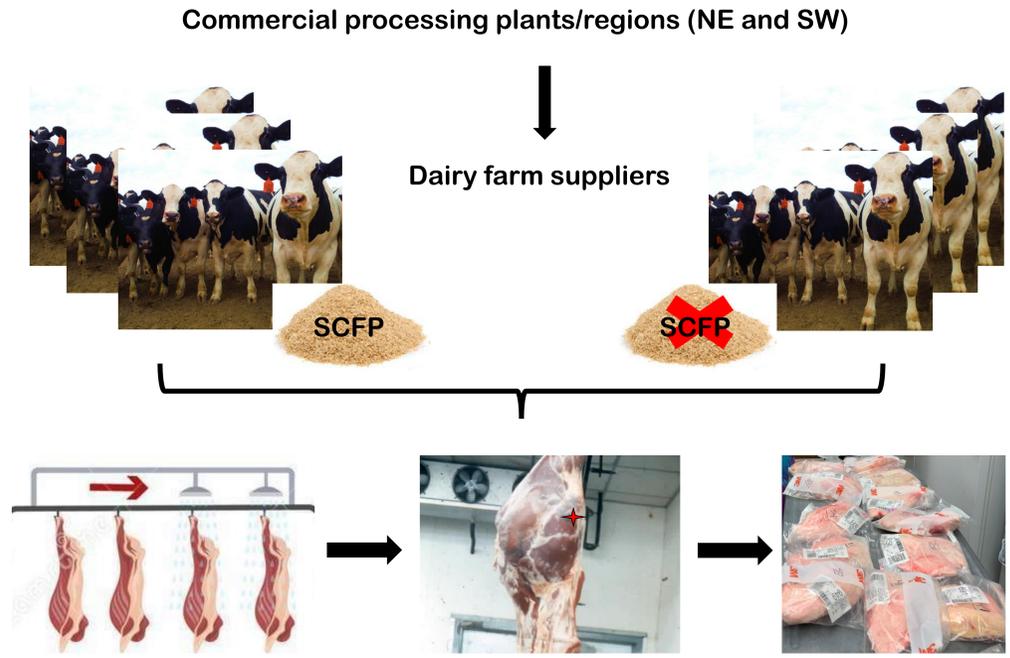
INTRODUCTION

- Salmonella* prevalence in the peripheral lymph nodes (LN) of cattle is a major problem in food safety, public health and one health as it has been identified as a major source of ground beef contamination, and thus of human illnesses
- Since post-harvest interventions cannot effectively control this route of contamination and that the complete removal of peripheral LNs from beef carcasses is not practically possible, current research is focused on identifying preharvest interventions to reduce the prevalence of *Salmonella* in cattle before they enter the food chain

OBJECTIVE

Evaluate whether the whole-farm feed supplementation of a *Saccharomyces cerevisiae* fermentation product (SCFP) is associated with the reduction in prevalence of *Salmonella* in the subiliac LN of culled dairy cattle, across regions and seasons.

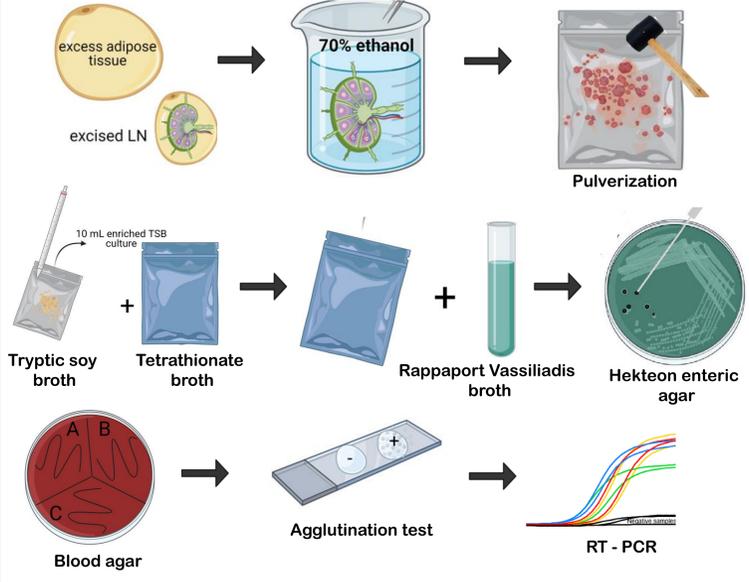
MATERIALS AND METHODS



Statistical analysis

Descriptive statistics were computed by feed additive status, season and region (Table 1 and 2). Multivariable mixed effects logistic regression model was fitted to evaluate associations between feed additive, season and region with within-supplier prevalence of *Salmonella* (Figure 1). Data were analyzed using SAS 9.4.

LN processing and laboratory techniques



RESULTS

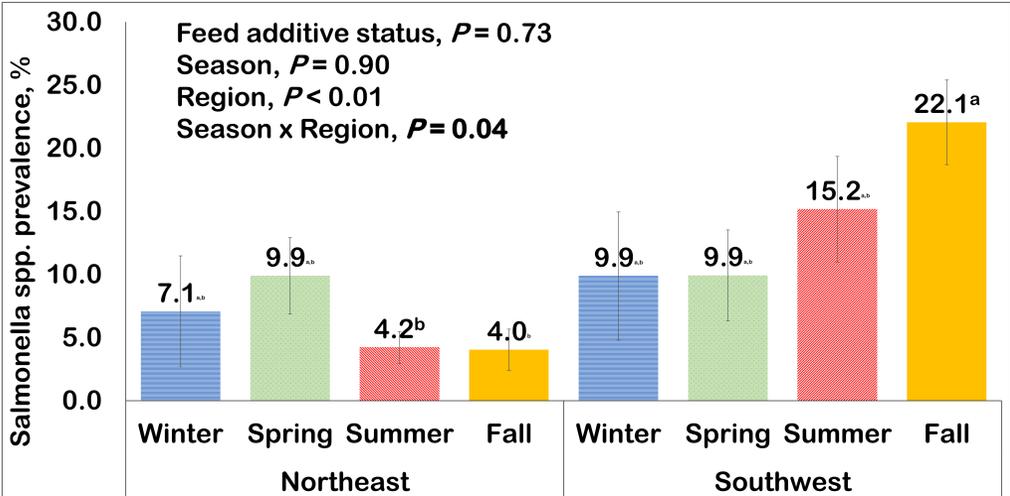
Table 1. Overall number and percentage of *Salmonella* test positive lymph nodes of cull dairy cattle by feed additive status, region and season (May, 2021 – November, 2022).

Feed additive status	SCFP	90/899 (10.0%)
	No-SCFP	83/874 (9.5%)
Region	NE	59/1,092 (5.4%)
	SW	114/681 (16.7%)
Season	Summer	44/639 (6.9%)
	Fall	82/617 (13.3%)
	Winter	12/141 (8.5%)
	Spring	35/376 (9.3%)
Total		173/1,773 (9.8%)

Table 2. Prevalence of dominant *Salmonella* serotypes isolated from the subiliac lymph nodes of culled dairy cattle across seasons, by region and feed additive status.

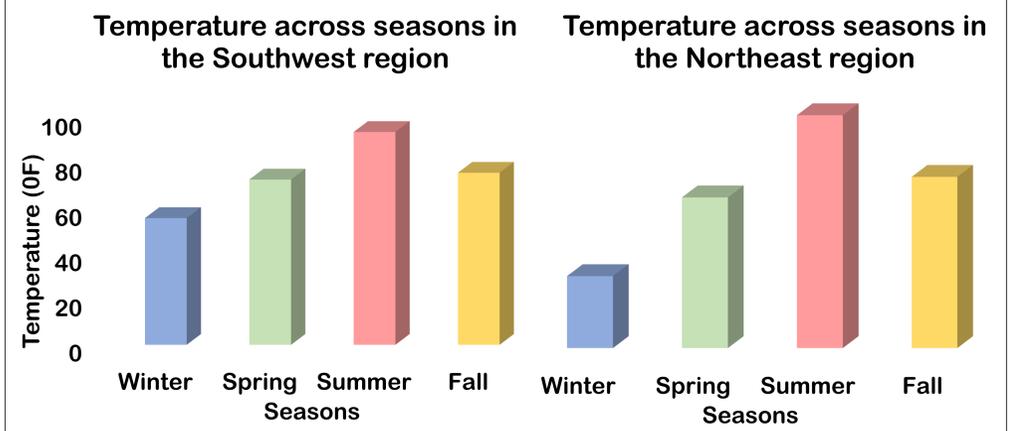
Serotype	Northeast		Southwest		Total by serotype (%)
	SCFP (%)	No-SCFP (%)	SCFP (%)	No-SCFP (%)	
Montevideo	12/39 (30.8)	13/22 (59.1)	11/31 (35.5)	22/31 (71)	58/123 (47.2)
Cerro	13/39 (33.3)	4/22 (18.2)	2/31 (6.5)	-	19/123 (15.4)
Muenster	1/39 (2.6)	-	6/31 (19.3)	5/31 (16.1)	12/123 (9.8)
Mbandaka	7/39 (17.9)	3/22 (13.6)	1/31 (3.2)	-	11/123 (8.9)

Figure 1. Model-adjusted mean within-farm *Salmonella* lymph node prevalence in cull dairy cattle across feed additive status, by season and region.



Error bars correspond to standard error of the mean

Figure 2. Temperature variation across all seasons in the Northeast and Southwest regions of the United States



DISCUSSION

- Our preliminary results show no significant differences in *Salmonella* LN prevalence between the SCFP and no-SCFP farms. However, the association between season with *Salmonella* prevalence in culled dairy cows depended on the region
- We hypothesize that temperature variation across seasons and regions (Figure 2) as well as differences in other dietary components and farm management strategies may be responsible for this outcome
- Identifying effective pre-harvest strategies to reduce *Salmonella* prevalence is essential in ensuring food safety and promoting public health

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