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Salmonella Prevalence in Lymph Nodes of Sows and Market Hogs in the United States

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Objectives

Antimicrobial interventions are applied to carcass surfaces to mitigate pathogens transferred during harvest. While highly effective, carcass surface interventions are unable to reduce pathogens located within fat-encased lymph nodes (LNs). For this reason, LNs have been identified as a potential cause of *Salmonella* in beef and pork products. The objectives of this study were to (1) establish a baseline for *Salmonella* prevalence in LNs of sows and market hogs in the United States, and (2) to determine the impact of carcass chilling methods on *Salmonella* prevalence in surveyed LNs.

Materials and Methods

A total of 21 commercial pork harvest facilities were categorized by region and hog type ($n = 8$ northern market hog, $n = 4$ northern sow, $n = 4$ southern market hog, and

$n = 5$ southern sow). As processing volumes allowed, 25 carcasses were selected from each establishment. From each carcass, left and right superficial inguinal LNs were removed, pooled ($n = 507$ total LN samples), and subjected to *Salmonella* prevalence determination. Additionally, type of carcass chilling method (conventional, blast chill, or other) used at each facility was recorded.

Results

Salmonella prevalence rates differed ($P < 0.05$) between hog types in both regions. Specifically, 6.4% of market hog and 37.0% of sow LN samples were found to be *Salmonella*-positive in the northern region; in the southern region, 13.0% of market hog and 4.8% of sow samples were *Salmonella*-positive. There was a difference ($P < 0.05$) in prevalence rates between regions (northern and southern) for sows, but not market hogs ($P > 0.05$). In the northern region, prevalence rates of *Salmonella* across

	Prevalence of <i>Salmonella</i> -positive lymph node (LNs) samples ^a by hog type, region and chilling method ^b	
	Region	
	Northern	Southern
<i>Hog type</i>		
Market hog	6.4 (13/202) A, X	13.0 (13/100) A, X
Sow	37.0 (37/100) B, X	4.8 (5/105) B, Y
<i>Chill type</i>		
Conventional	20.0 (10/50) A	20.0 (10/50) A
Blast chill	1.3 (1/77) B	0.0 (0/25) A
Other	2.7 (2/75) B	12.0 (3/25) A

A,B: Values within a column lacking a common letter differ ($P < 0.05$).

X,Y: Values within a row lacking a common letter differ ($P < 0.05$).

^a Market hogs or sows were harvested and left and right superficial inguinal LNs ($n = 1014$ LNs) were removed.

Within animal, left and right LNs were pooled ($n = 507$ total samples).

^b Carcass chilling methods were defined as: (1) conventional – standard cold storage unit without forced air circulation or water spray; (2) blast chill – cold storage unit with forced air circulation and without water spray; or (3) other – conventional or blast chill with water spray or other quick chill system. Carcass chilling methods were only documented for establishments harvesting market hogs, as all sow carcasses were hot-boned.

chilling types were as follows: 20.0, 2.7, and 1.3% positive for conventional, other, and blast chill methods, respectively. Additionally, in the southern region, there were 20.0% positive samples for conventional, 0.0% for blast chill, and 12.0% for other chill methods. In both regions, samples from conventionally chilled carcasses returned more ($P < 0.017$) positive results than any other chill method.

Conclusion

The higher rate of *Salmonella* prevalence in northern sows warrants further investigation. Members of the pork industry would benefit from the identification of subsequent research needs or possible process improvements to address the presence of *Salmonella* in porcine LNs.