

# Improvement in the detection of viral contamination in shellfish in Italy through interlaboratory exercises

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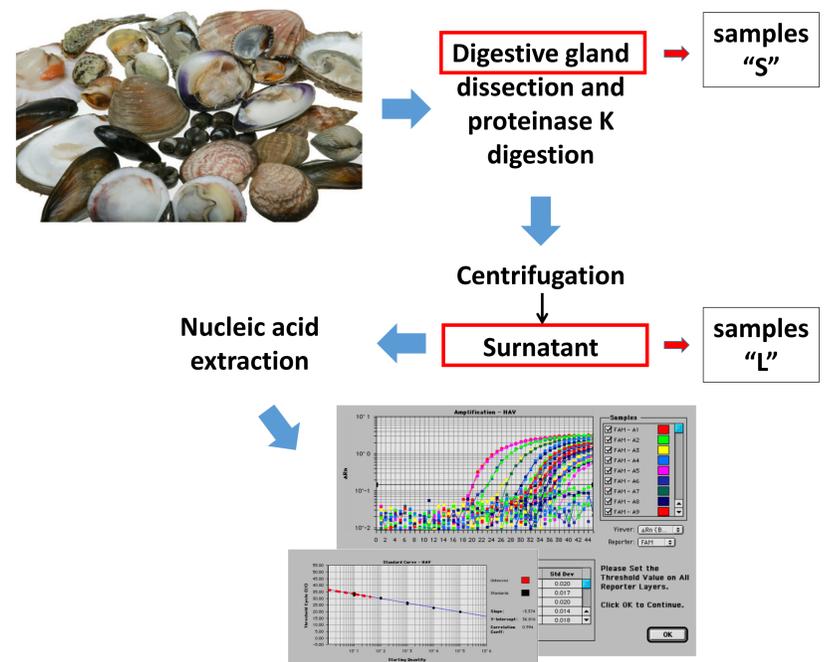
## Introduction

Bivalve shellfish are internationally recognized as a potential vehicle for human enteric viruses transmission, especially Hepatitis A (HAV) and Noroviruses (NoV). In view of the definition of a standardized reference method for detection of HAV and NoV in foods - later published as ISO/TS 15216-2:2013 - the Istituto Superiore di Sanità, as the Italian National Reference Laboratory (NRL) for monitoring of viral contamination in bivalve molluscs, developed in 2012 a proficiency testing scheme to verify the progressive harmonization of detection procedures and ensure the quality of results produced by Italian official control laboratories.

**Fig. 2**  
Italian public veterinary institutes involved in official controls



**Fig. 1**  
Standardized procedure based on ISO/TS 15216-2



## Materials and methods

A standardized procedure (Fig. 1) based on ISO/TS 15216-2 draft and accredited by the NRL was made available to the laboratories, together with training activities and reference materials for its implementation. Three sample distributions were organized in 2012, 2013 and 2014 and a minimum of 10 laboratories participated in the exercises, covering the whole network of the Istituti Zooprofilattici Sperimentali (Fig. 2). Each distribution included 2 shellfish digestive gland homogenates (samples "S") to assess performance on the whole procedure, and 4 to 6 shellfish liquid extracts (samples "L") to evaluate nucleic acid extraction and PCR detection. The participants' results were evaluated to calculate sensitivity, specificity and accuracy of HAV, NoV genogroup I (NoV GI) and NoV genogroup II (NoV GII) detection.

## Results and discussion

Altogether, the results obtained by the laboratories (Tab. 1) showed, over the years, a relevant improvement of the performance for all of the targets, reaching an accuracy >90% in 2014 (100% for HAV, 92.5% for NoVGI and 93.6% for NoVGII). The more significant progresses were shown in the analysis of the more complex matrix, the shellfish digestive gland homogenate, with the detection accuracy increasing from 38.9% to 100% for HAV, and from 55.0% and 65.0% to 95.2% and 100% respectively for NoVGI and GII.

**Tab. 1**  
Accuracy (%) of the detection of HAV, NoV GI and NoV GII on shellfish digestive tissue (S) and shellfish extracts (L)

Year	N° labs	HAV			NoV GI			NoV GII		
		S	L	total	S	L	total	S	L	total
2012	10	38,9	93,3	77,8	55,0	80,0	72,9	65,0	84,0	78,6
2013	11	77,3	98,5	93,2	90,9	87,9	88,6	100,0	96,7	97,5
2014	12	100,0	100,0	100,0	95,2	91,7	92,5	100,0	91,7	93,6

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