

The Hypo-Osmotic Swelling Test – A systematic review of test characteristics

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Introduction

According to several authors the hypo-osmotic swelling test (HOS test) provides a valuable additional parameter to standard canine semen analysis (1,2). It is a simple, inexpensive test to evaluate the functional integrity of sperm cell membranes (3,4).

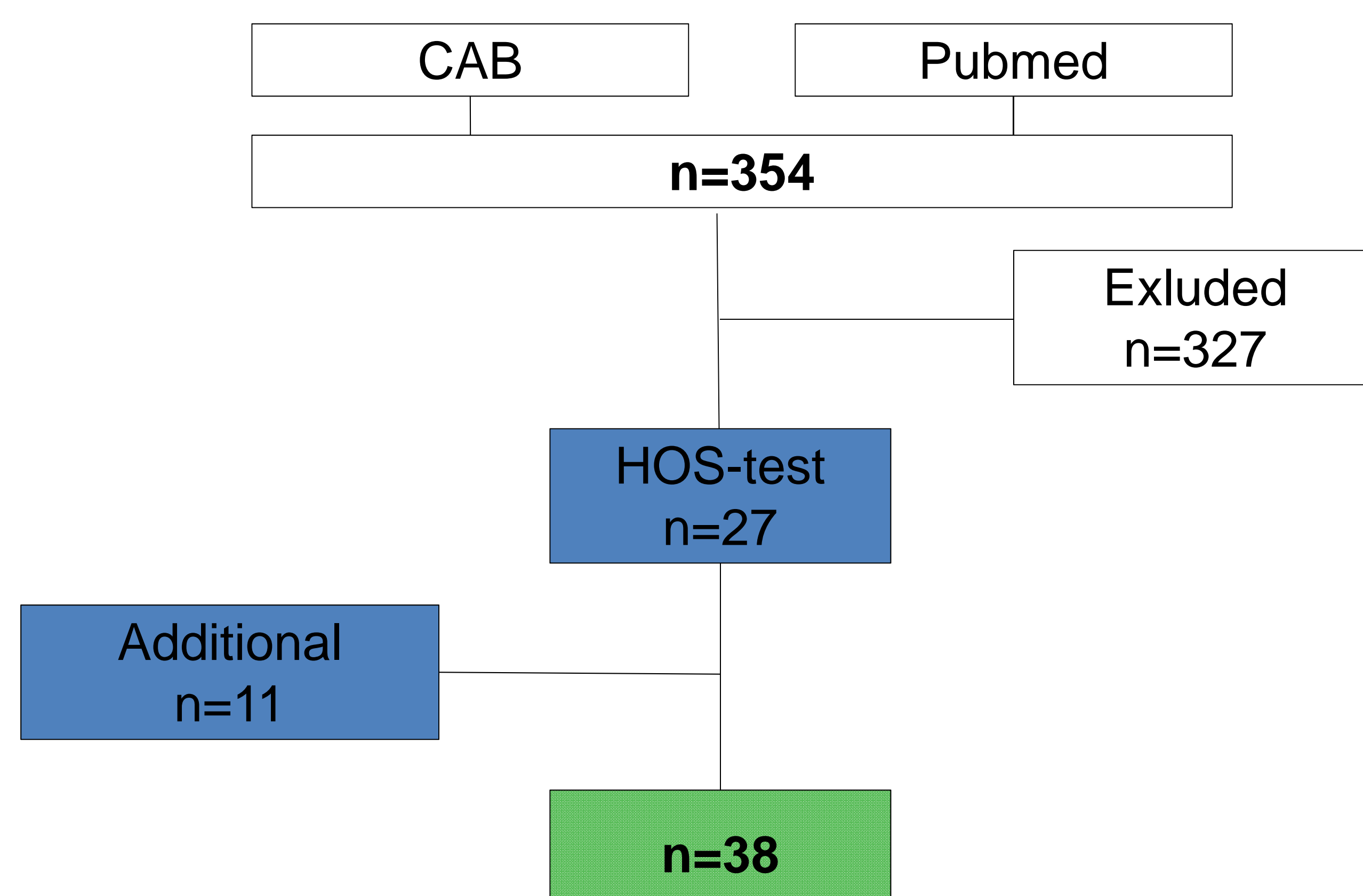
The HOS test: Spermatozoa are exposed to hypo-osmotic solutions. Under these conditions viable spermatozoa swell due to water influx. The proportion of swollen (intact membranes) and non-swollen (damaged membranes) sperms can be counted under phase contrast microscope.

The aim of this systematic review was to evaluate the quality of published literature on canine reproduction concerning the HOS test:

- 1) Diagnostic value?
- 2) Reference values?
- 3) Quality?

Materials and Methods

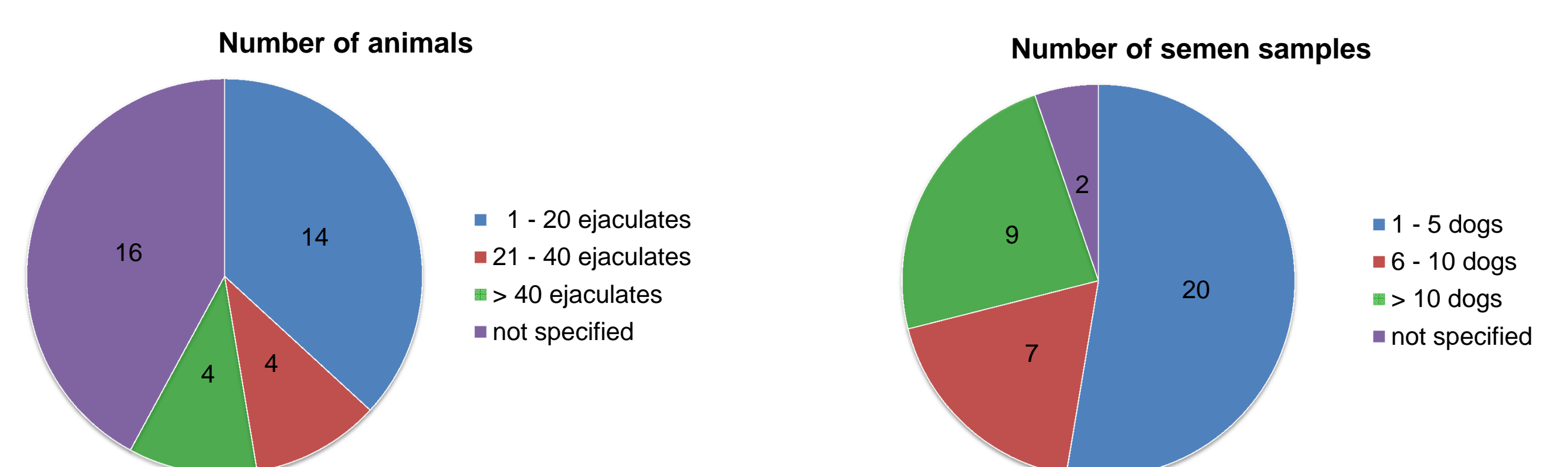
Using the databases CAB and PubMed, 38 articles were found and analysed regarding various aspects like study design, enrolled animals, semen sampling methods and HOS test protocols.



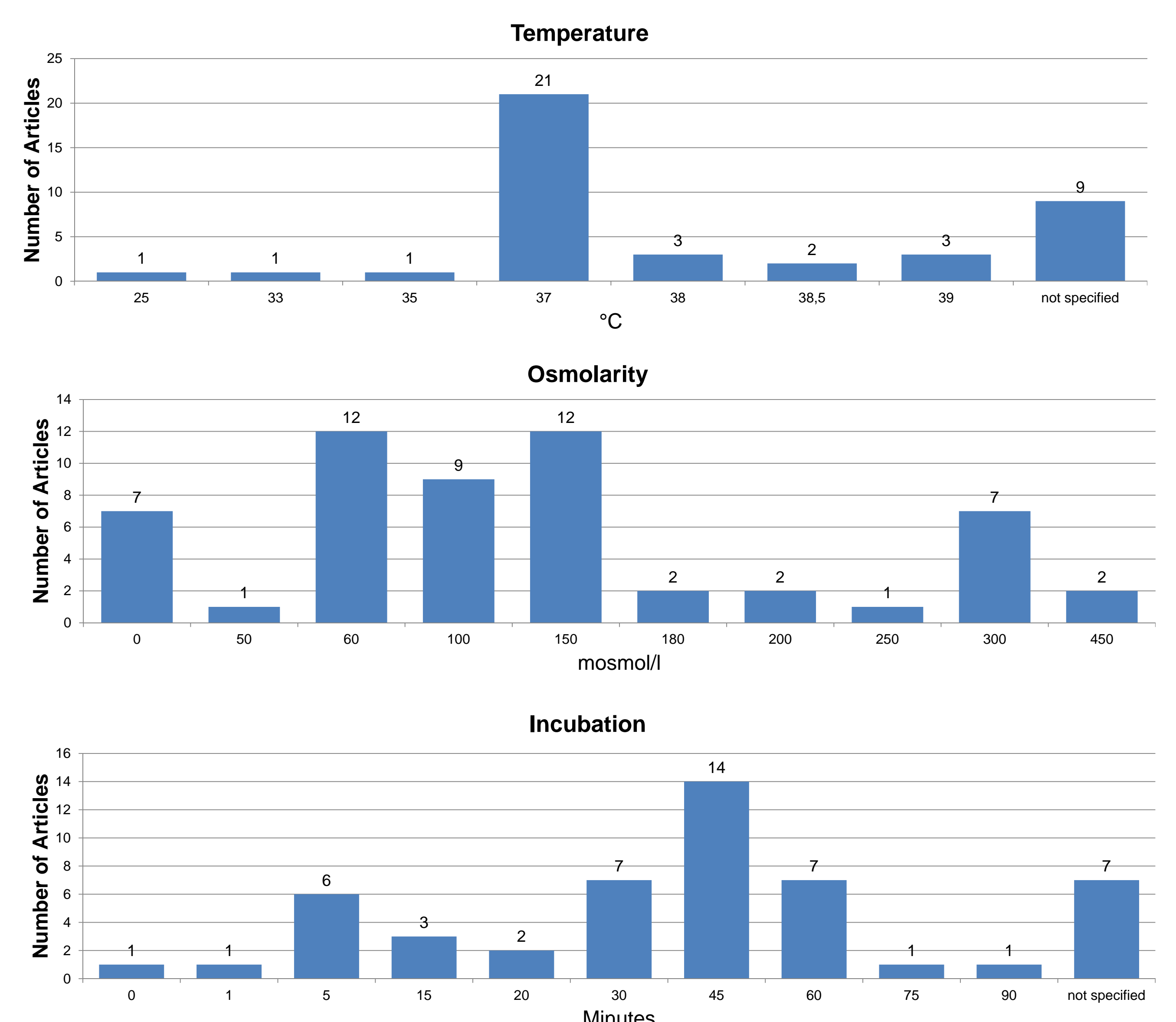
References:
(1) Rodriguez-Gil et al., Theriogenology 1994; 42:815-829.
(2) Goericke-Pesch et al., Reprod in Dom Anim 2013;48, 213-217.
(3) Kumi-Diaka, Theriogenology 1993;39:1279-1289.
(4) Quintela et al., Anim Reprod 2010;7:70-74.

Results

Most of the trials evaluated showed serious methodological flaws and therefore did not permit drawing sound conclusions. According to our results, approximately half of the studies included a sample size of five or less animals.



All articles were based on prospective studies. None of the studies was specified as being randomized, and only one study was identified as blinded. Reference values were defined in one study. None of the studies examined the inter- or intraobserver agreement for the HOS-test. Until now, neither a standardized test protocol nor reliable reference ranges have been defined.



Conclusions

Several authors conclude that the HOS-test represents an additional tool to conventional evaluation of semen quality despite a **death of information** regarding its diagnostic value. **Further research** is warranted including appropriate statistical methods and a sufficient number of animals to establish a **standardized test protocol** as well as reliable **reference values**.

