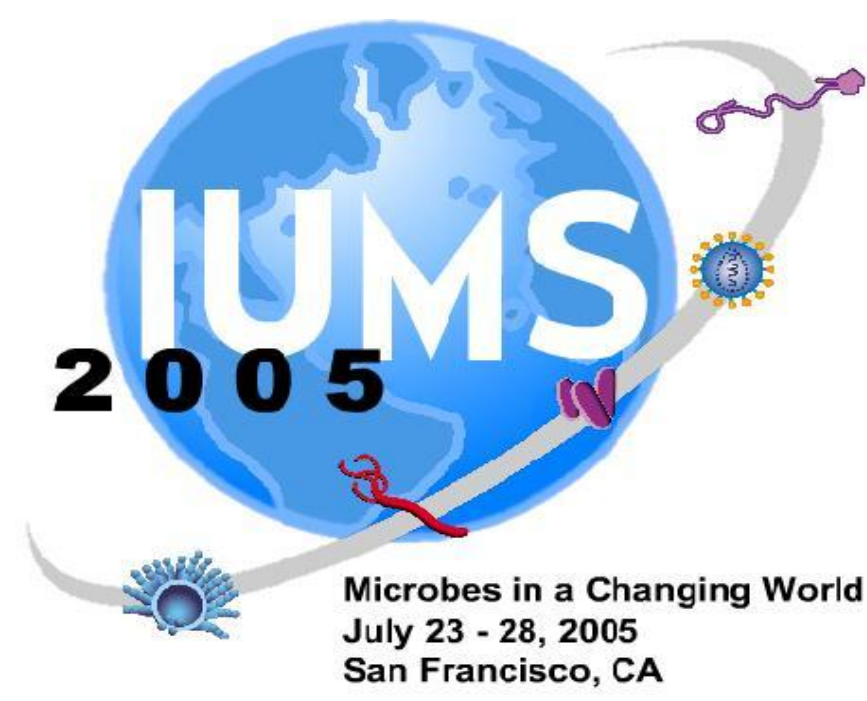


EFFECT OF TEMPERATURE, PH AND TYPE OF ACID ON THE INACTIVATION OF *LISTERIA INNOCUA*



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INTRODUCTION

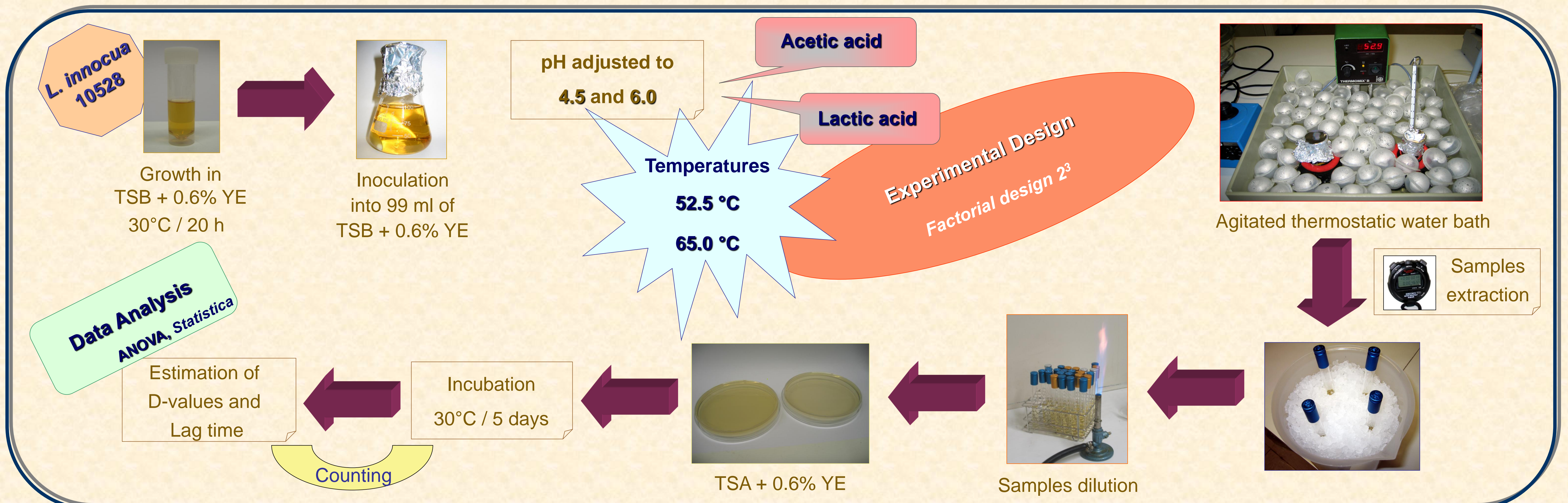
Listeria innocua is a non pathogenic specie, physiologically very close to *L. monocytogenes*, that can be isolated in the same food products. It is considered a biological indicator of the pathogenic *L. monocytogenes*, which causes the majority of outbreaks and sporadic cases of listeriosis.

Bacteria thermal resistance is a result of a number of stressing environmental factors. Combined effects of temperature and pH have been proven to affect the survival of microorganisms. Nevertheless, studies on the type of acid used and the influence of all combined effects on inactivation behaviour are not well exploited.

Heat resistance of bacteria should not be merely evaluated on the basis of maximum inactivation rates, but also on the lag and/or tailing phenomena observed, thus contributing to the design and control of efficient inactivation processes.

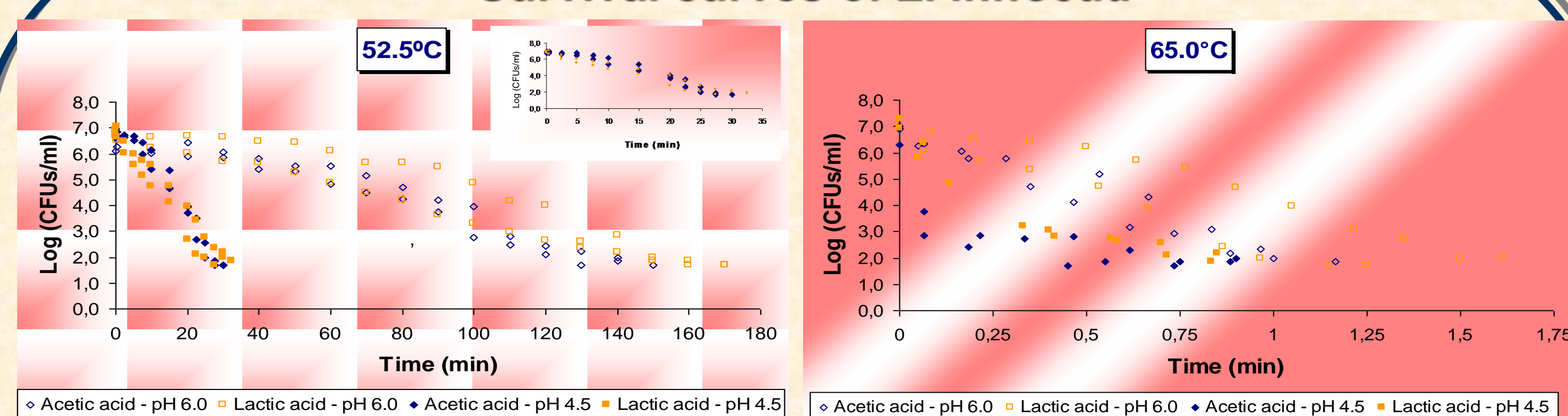
This work intends to study the main effects and interactions of temperature, pH and type of acid on the thermal resistance of *L. innocua*.

METHODS



RESULTS

Survival curves of *L. innocua*



- The shape of the inactivation curves greatly depended on the different conditions used.
- Lag phases were observed at the lowest temperature and highest pH values.
- Tailing regions were observed in all conditions.

Influence of temperature, pH and type of acid on D-values

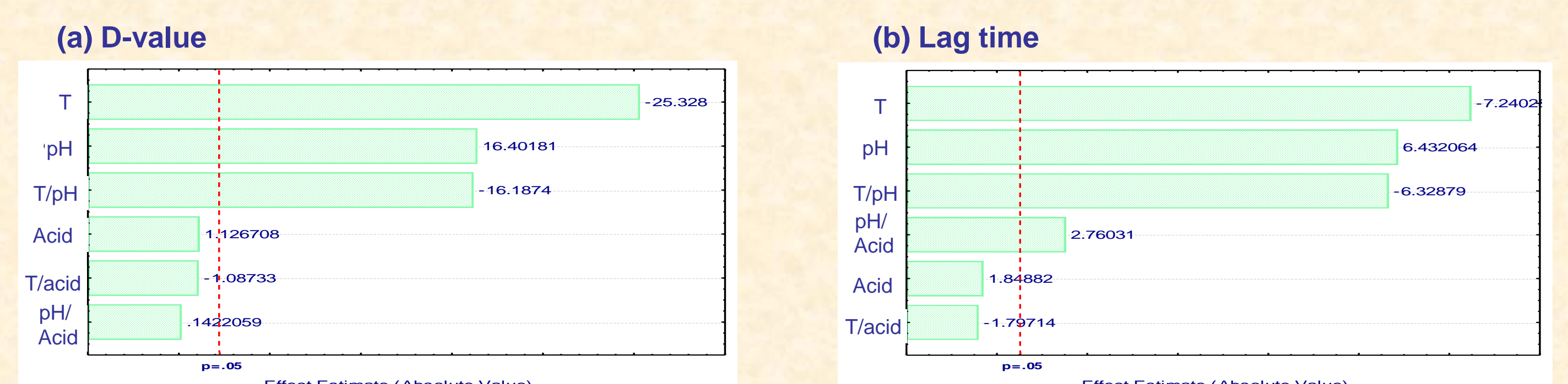
Temperature (°C)	D-values (min) ± 95% Standard error			
	pH 4.5		pH 6.0	
	Acetic acid	Lactic Acid	Acetic acid	Lactic acid
52.5	4.75 ± 0.69	5.72 ± 0.75	23.92 ± 3.21	25.95 ± 7.28
65.0	0.057 ± 0.055	0.10 ± 0.03	0.21 ± 0.04	0.30 ± 0.17

D-value: Decimal reduction time

Higher D-values were obtained when combining the lowest temperature with the highest pH values (T=52.5°C; pH=6.0).

Similar D-values were obtained for both acids used.

Effects of temperature, pH and type of acid on D-value (a) and Lag time (b)



Temperature, pH and the combination of these two factors affected significantly the D-values of *L. innocua* (p<5%).

Lag time was affected by temperature, pH and combined effects of temperature/pH and pH/type of acid (p<5%).

CONCLUSIONS

Although temperature has the major effect on *L. innocua* survival, the interaction of temperature/pH is also significantly important.

The type of acid used combined with pH influenced the lag time of the inactivation curves.

These results showed the importance of a global analysis of the environmental factors in the design of appropriate inactivation processes.

ACKNOWLEDGEMENTS

The author F. A. Miller would like to thank the Ph.D. grant SFRH/BD/11358/2002 to FCT and the financial support provided by Fundação Luso-Americana. T.R.S. Brandão also acknowledges financial support to FCT (grant SFRH/11580/2002).

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