

XIXth European Meeting of Meat Research WorkersParis 2-7 Sept. 1973.The time course of rigor mortis in pig muscle.Registration in different muscles by different methods.

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Introduction

A report was given for the 1969 meeting in Helsinki (Sybesma, 1969) about the relation between the stiffness in the m. semimembranosus in situ measured by a device a so called rigor meter and the muscle ATP content.

A quick developed stiffness was accompanied by a low ATP content.

Therefore the measurement of the stiffness immediately after slaughter was regarded as a measurement of rigor mortis.

In this report data are given on a comparison between the rigor measurement in the m. semimembranosus and data about changes in extensibility (isotonic) of the m. longissimus dorsi as described by Schmidt et al (1968).

Material and method

In two trials with 10 Pietrains each the development of the rigor mortis in the m. long. dorsi according to Schmidt et al (1968) with a transducer set was compared with the stiffness measurement according to Sybesma (1966).

The animals were slaughtered in the Institutes slaughter laboratory where the development of the rigor in the m. long. dorsi and the m. semimembranosus were recorded with the two different methods. At 60 minutes

post-slaughter the pH of the m. long. dorsi was measured with a portable pH meter (Electrofact type 36100).

Results

In figure 1 the development of the rigor in two different muscles of one pig has been drawn.

The stiffening of the ham muscle did not concord in each pig so well with the loss of extensibility of the muscle strip, but the tendency was mostly clear.

In table 1 the data are given only about the rigor measurement of the m.semimembranosus 60 minutes post mortem, the pH of the long.dorsi muscle at the same time and the required time in hours for the loss of extensibility of the m.long.dorsi strip.

Table 1. The development of stiffness in the ham, the pH level in the m.long.dorsi 60 min. post mortem and the time required for the loss of extensibility of a m.long.dorsi strip of 20 Pietrain pigs.

Pig nr.	Experiment 1			Pig nr.	Experiment 2		
	rigor units	pH	time		rigor units	pH	time
1	5	6.0	5.50	11	7	5.7	----
2	6	5.4	2.17	12	5	5.6	3.75
3	10	5.4	1.25	13	8	5.5	2.50
4	4	6.0	9.00	14	4	5.8	1.75
5	9	5.6	3.25	15	6	5.6	1.00
6	4	5.8	5.50	16	7	6.0	4.75
7	10	5.5	1.25	17	6	5.5	2.00
8	6	5.6	3.67	18	6	5.6	0.75
9	7	6.0	4.33	19	7	5.6	1.50
10	10	5.5	0.75	20	3	6.0	5.00

In the first 10 pigs it was obvious that the higher the stiffness the shorter the time for extensibility loss was.

In the second 10 pigs although the lowest rigor development (nr.20) showed the longest duration for the muscle strip the correlation did hardly exist for the rest of the group.

In table 2 the statistical calculation did reveal a close relationship between the pH level of the m.long.dorsi and the time duration for the strip.

Table 2. The correlations calculated between different muscles in regard to post mortem changes.

	Experiment 1	Experiment 2
m.semimembranosus x time course	0.85**	-0.29
pH 60 min. m.long.dorsi x time course	0.89**	0.71*
rigor membranosus x pH long.dorsi	-0.67*	-0.48

(**P < 0.01)

(*P < 0.05)

Discussion and conclusion

In the first group the variation in the development of rigor expressed in rigor units 60 minutes post mortem was greater than that in the second group.

The relation between the stiffness in the ham and the time required for the loss of extensibility of a m.long.dorsi strip was much better in the first group.

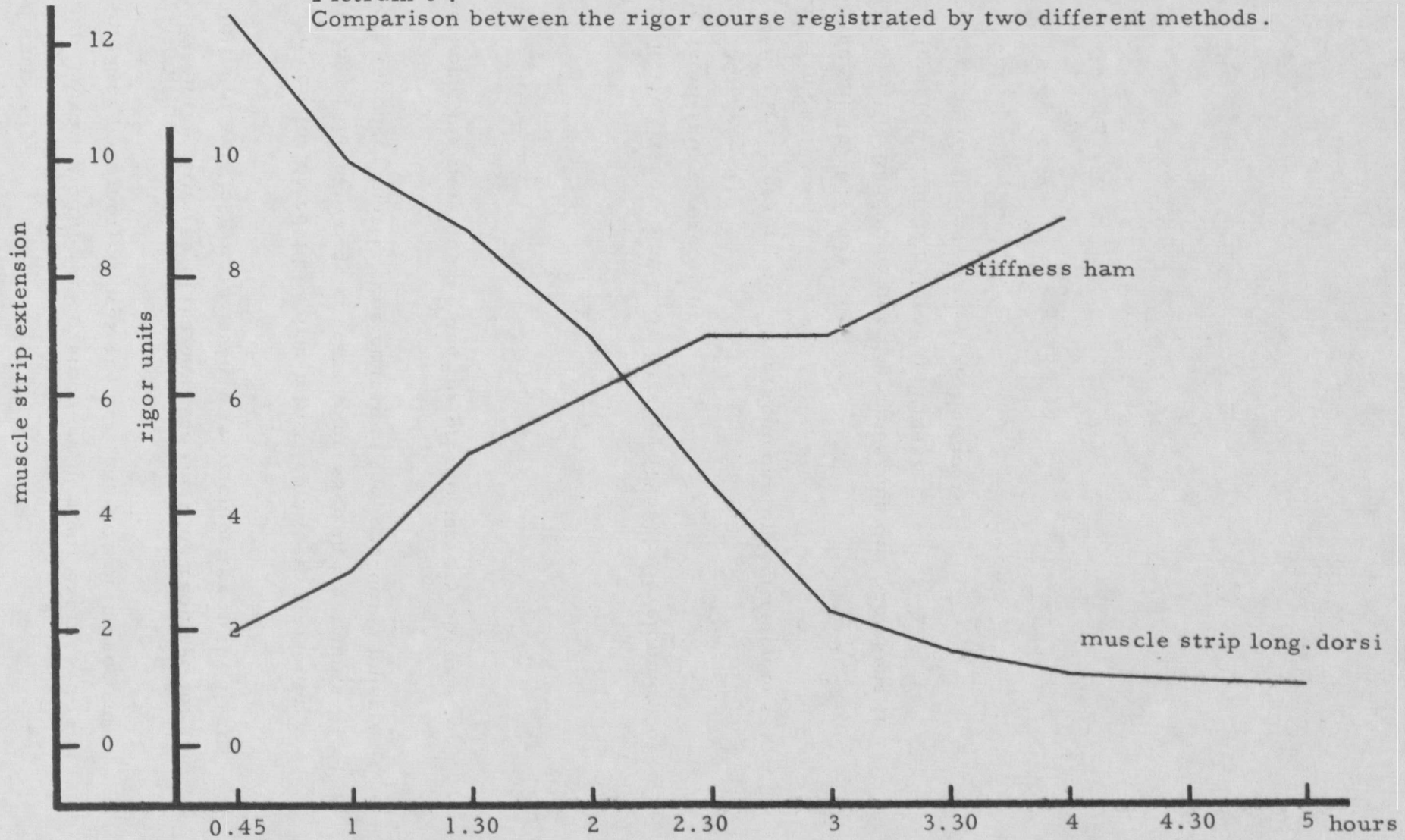
In our opinion the conclusion could be drawn that from the material as a whole the stiffening of the ham c.q. carcass expressed in rigor units corresponds with the rigor mortis time course of the long.dorsi muscle strip.

The relation between this time course and the pH fall is very obvious for both groups.

Literature

- Schmidt, G.R., R.G. Cassens and E.J. Briskey (1968) : Development of an isotonic-isometric rigorometer.
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- Sybesma, W (1966) : Die Messung des Unterschiedes im Auftreten des Rigor mortis in Schinken.
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- Sybesma, W (1969) : Die Bedeutung der Rigormessung des Schinkens in Bezug auf Fleischqualität und Umwelteinflüsse.
XVth Eur. Meeting Meat Res. Workers, Helsinki.

Pietrain 6 :
Comparison between the rigor course registered by two different methods.



LE DELAI D'ETABLISSEMENT DE LA RIGOR MORTIS DANS LE

MUSCLE DE PORC - ENREGISTREMENT DANS DIFFERENTS MUSCLES

PAR DIFFERENTES METHODES.

W Sybesma et P g Van der Wal
Pays Bas

Résumé :

Le délai d'établissement de la rigor mortis a été enregistré sur un fragment de m longissimus dorsi de 20 porcs de race pietrain selon la méthode de Schmidt et col (1968) - ainsi que parallèlement la rigidité du jambon selon la méthode de Sybesma (1966).

Il a pû être démontré que le développement de la rigidité dans le jambon correspondait au délai d'établissement de la rigor mortis dans le fragment de longissimus dorsi.

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Summary

The rigor mortis time course of a long. dorsi muscle strip in twenty pigs of the Pietrain breed was recorded according to Schmidt et al (1968).

At the same time the development of the stiffness of the ham was measured according to Sybesma (1966).

It could be demonstrated that the development of the stiffness of the ham corresponded in general with the rigor mortis time course of the muscle strip.

The relation between rigor mortis and pH fall in the same muscle was very obvious in these pigs.