INCIDENCE OF PSE IN COMMERCIAL PIG CARCASSES IN RIO GRANDE DO SUL STATE, BRAZIL.

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S-IVA.01

SUMMARY

The aim of this work was to evaluate the quality of pig meat in relation to the PSE incidence in the State of Rio Grande do Sul. This State, situated on the extreme south of Brazil, that holds the fourth swine herd in the world, was colonized mainly by German and Italian people that favoured the improvement of swine herd and pig industries. The European people also introduced some breeds like Duroc, Landrace, Large White and others. At present, about 20% of brazilian swine herd is located in Rio Grande do Sul .The yeld production in this State is about 100% or more while in Brazil it is only 50%. In this survey four abattoirs were selected, from different regions of Rio Grande do Sul in which there are the highest pig concentration. 8842 carcasses from commercial pigs have been used and initial pH measurement (pH1<5,9), taken at 45 minutes after slaughter on the longissimus dorsi muscle was used as a method to detect PSE carcasses. Each establishment was visited for four days in one year, each day representing a different season. In springtime 964 pH1 values were collected, with a 6,10 ±0,31 average and a PSE frequency of 21,01%. In the summer 2024 pH1 values were taken, with 6,06±0,32 average and a PSE frequency of 26,77%. 2719 pH1 values were collected in the autumn, with 6,00±0,30 average and a PSE frequency of 31,92%. In the winter, 3135 pH1 values were collected, with 6,00±0,30 average and a PSE incidence of 32,97%. The mean value of PSE incidence was 28,16%. The pH1 mean value in autumn and winter was lower (P<0,001) than that in the spring and summertime. The pH1 mean value in summer was lower (P<0,001) than that in springtime. The frequency of PSE was affected by the seasons (P<0,01). 28,16% is a high incidence of PSE and probably reflects on pork processing.

Introduction

Brazil holds the fourth swine herd in the world. The Rio Grande do Sul State(RS), on its extreme south, was colonized mainly by German and Italian people, who have been well adapted in this region.

Geographic and climatic conditions in RS are well similar to some european regions, so germans and italians could bring their activities, including animal breeding. This favoured the improvement of swine herd and pig industries, introducing some breeds like Duroc, Landrace, Large White and others. Improvement of swine herds in BrazilianSouthern Region were so great we can compare it now to any developed countries in the world. At present, about 20% of brazilian swine herd is in RS and its yeld production is more than 100%, while in Brazil it is only 50%.

The development of swine breeding in RS led to PSE andDFD meats. The incidence of this anomaly may be increasing because genetics is focused on a leaner carcass. Works developed in RS by Culau et al. (1991) and Bressan et al. (1992) pointed out an incidence of approximatly 20% of PSE pork, depending on the season, the handling before slaughter and some conditions of the plant, specially in relation to the chilling methods. This is a relevant fact because PSE meats present serious disadvantages of quality and processing, as the drip loss (Smith & Lesser, 1982; Hofmann, 1988).

Culau et al. (1991) observed that initial pH of pork was inferior when animals were slaughtered in higher temperatures leading to a higher incidence of PSE carcasses. The authors found significative differences of PSE incidence in warm and cold periods.

Cassens et al.(1992) reported an incidence of 16% of PSE pork in a survey covering fourteen commercial plants in the USA. The authors asserted that this represents an alarming proportion concerning to the industry. Brazil has no statistics about PSE , so it is difficult to establish if this anomaly means a real problem to the pork industry.

The aim of this work was to evaluate the incidence of PSE pigmeat in RS.

Materials and Methods

To this survey, four abattoirs were selected from different regions of RS where there are the highest pig concentration. The names of companies and their location were omitted for ethic reasons.

8842 carcasses from commercial pigs were used. The initial pH measurement (pH1<5,9) was taken 45 minutes after slaughter, on the longissimus dorsi muscle, with a portable equipment, to detect PSE carcasses (Barton-Gade, 1980; Yang et al., 1984).

Each establishment was visited for four days in one year, each day representing a season of the year. The first period was November, 1992, corresponding to springtime. The second period was February, 1993, corresponding to the summer. The third one was in May, 1993 (autumn) and the fourth was August, 1993 (winter).

From the slaughtered animals of each workday the maximum possible number of carcasses was examined. The total number of carcasses analysed represented approximately 0,4% of the slaughtered pigs during one year in the four plants.

Data were submitted to the analysis of variance and the means were tested by a Tukey's test adapted to different number of repetitions.

Results and Discussion

Table 1 shows the total number of carcasses analysed within each season and each plant. At the beginning of our work there have been some troubles at the plants, so it was not possible to us to examine many carcasses. o, the spring sample was smaller than the others. In wintertime, our improved experience helped us to attain a larger sample of carcasses.

The initial pH means shared out in accordance with season and slaughterhouse are in Table 2. In spring time the average of pH1 was 6,10±0,31. In summer, the mean pH1 was 6,06±0,32. In the autumn and in the winterthe means pH1 were 6,00 with a standard deviation of 0,31 and 0,30, respectively.

As the survey was conducted during all the seasons of the year, in four different companies, data collected were submitted to an analysis of variance (Table 3). The results showed that both the season and the slaughterhouse plant affected the initial pH values of meat ($P<0,001$). The factory effect was expected because genetics, handling procedures before the slaughter and chilling techniques employed were different. However, the effect of the season of the year was somehow the opposite of what it would be expected. In the autum and winter the pH means values were lower ($P<0,001$) than those of spring and summer. The pH mean in summer was inferior that initial pH mean in spring, which is in accordance with Culau et al. (1992).

Results got in the autumn and in winter may be explained by the climatic conditions of RS. There are some days, in these seasons when temperature varies largely and suddenly, ranging from 10 to 30_C in a period of 24 hours or even less. This phenomenon may also affect the incidence of PSE (Table 4): in spring the PSE frequency was 21,01%; in summer it grew to 26,77% and in autumn and winter the frequencies were 31,92% and 32,97% ($P<0,01$).

The PSE average in this survey was 28,16%, superior to the value reported by Cassens et al. (1992), who found 16% of PSE in USA. It is known that pH1<5,9 gives only an estimation and the real incidence of PSE may be lower. However, even with a lower incidence, less than 28, 16%, it may yet reflect on pork processing.

Conclusion

Considering the results of this survey, it is suggested the necessity to promote other works using different criteria, as the subjective evaluation of meat, to complement the pH1 values.

Also, the factories could adopt improved handling procedures as avoiding the transport of animals during hot periods, even in winter, so minimizing the stress before slaughter. They could also try to standardize the cares with carcasses after slaughter, mainly the chilling process.

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