EVALUATION OF MEAT QUALITY CHARACTERISTICS IN THE ITALIAN HEAVY PIG

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ABSTRACT

Two surveys were made on 1008 and 205 carcasses to study several meat quality traits and to assess qualitative aspects of meat from Italian heavy pigs. Measurements were made of pH_f, pH_u, water holding capacity (WHC) by Filter Paper Press (FPP) and Kapillar Volumeter (KV), drip loss and colour (Hunter L,a,b). Values for pH_f, pH_u and FPP were taken in several muscles and muscle sites. The carcasses were subjectively classified as normal, PSE or DFD.

The incidence of PSE was 4.1 percent and very little DFD was found. Almost all of the meat quality traits were correlated with each other. Abattoir effects strongly influenced the parameters tested. Measurements of pH_f, FPP and KV only provided a rough index for PSE estimation. An advantage of pH_f is that it can be measured more easily, quickly and cheaply than the other parameters.

Drip loss averaged 3.9 percent with a range from 1.2 to 10.2 percent and a non-normal distribution. Spearman's rank correlation coefficients showed a link between drip loss and other parameters. The high correlation with the L value of the L,a,b system is of special interest for estimating drip loss in the early post-slaughter period using portable instruments.

INTRODUCTION

Italian pig breeding differs from that of other European countries, producing chiefly a heavy pig, all of which, except for the loin, is used for processing. The main aim of heavy pig production is to obtain typical seasoned products, in particular hams and quality salami. In Italy, then, meat quality is extremely important, not only from the point of view of nutrition and taste, but for processing technology (Russo, 1984).

Our goal was firstly to assess meat quality in a typical area of heavy pig production, the Po Valley, and secondly to determine the effect of different sources of variation including sex, genetic type, abattoir, carcass weight and slaughtering season. A third aim was to evaluate the incidence of PSE and DFD and to find out whether limit values for these conditions can be established for the normal population. To achieve these aims, a first survey assessed meat quality, pH_f, pH_u and water holding capacity (WHC) in a sample of 1008 carcasses. In a second trial, drip loss and its relationship with pH value, WHC and colour was evaluated. The
effect of different sources of variation has been discussed in a previous paper (Bosi et al., 1985).

MATERIALS AND METHODS

In the first survey, 1008 heavy pig carcasses were randomly chosen, over a two-year period, from five abattoirs located in the Po Valley. Knowledge of genetic type was the only restriction. In the second survey 205 heavy carcasses from different farms in the Po Valley and slaughtered in the same abattoir, were used.

About 25 carcasses per day were examined in the first survey and about 6 per day in the second survey. Maximum transportation time from farm to abattoir was 2 h. Almost all the pigs were slaughtered after a night's rest. Sex, genetic type and carcass weight were recorded. The average carcass weight was 132 ± 23 kg in the first test and 135 ± 14 kg in the second. The predominant genetic type was Large White x Landrace, but there were also Large White, Landrace and several crosses with Duroc and Spotted breeds.

In the first trial, meat quality was measured on the right side of the carcasses. The pH and pH were taken on M. semimembranosus (SM), M. biceps femoris (BF), and M. longissimus dorsi (LD). In the LD pH values were taken at the 6th rib (6r), where the loin cut ('lombata') separates from the neck cut ('coppa') and at the last rib (Lr). Two portable Digipok Radiometer pH meters fitted with Ingold probe-type electrodes were used. At 1 h post mortem a 0.5 kg sample of LD was taken from the 6th rib and four hours later, water holding capacity (WHC) was tested with a Kapillar Volumeter (KV) and by the filter paper press (FPP) method. WHC was also measured on the BF by FPP in the same area where pH values had been taken, 5 and 30 h post mortem. The KV was described by Hofmann (1975). Readings were taken at 30, 60, 90 and 120 seconds but only the 60 second data are reported here. From an operational point of view, this seems to be the best time as it was more highly correlated with the readings taken at 90 and 120 seconds than was the 30 second reading and was less time consuming than the former (Russo et al., 1982). The FPP area was determined according to Grau and Hamm (1957) with a meat sample of 0.3 g and a 1 kg weight applied for 5 minutes. The values obtained correspond to the difference between the whole wet area and the meat area. The carcasses were classified as PSE or DFD if they clearly showed