

Ready-to-eat roasted suckling piglet (*Porcheddu*): an innovative process for a Sardinian traditional dish

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ADDITIONAL KEYWORDS

Baking.
Salting.
African Swine Fever.
Heat treatment.

SUMMARY

Roasted piglet (*Porcheddu*) is one of the most appreciated traditional Sardinian dishes obtained from suckling animals slaughtered at 8-12 kg of body weight (BW). The traditional cooking method is time-consuming; this dish is eaten only when there is enough time for its preparation (cooking time of about 2 h). The *Porcheddu* is appreciated by both local and foreign consumers and there is also an increasing interest, for this traditional dish, by extra regional consumers and markets. Actually, since the occurrence of African swine fever (ASF), the trade of pigs and pig meat products is not permitted from Sardinia. The Council Directive 2002/99/EC provided a derogation for states member to authorize the production, processing and distribution of products of animal origin when a *Heat treatment at a minimum temperature of 80°C, which must be reached throughout the meat is applied*. The overall framework of this study was to evaluate an innovative process to obtain a traditional dish the *Porcheddu* suitable to achieve extra-regional markets and meet the demand of modern consumers and to assess the effect of carcass weight on the processing yield of suckling piglets, thermally treated, to obtain a ready-to-eat roast dish.

Un processo innovativo per la produzione di un piatto tradizionale della Sardegna: il maialeto (*Porcheddu*) arrosto

RESUMEN

Il suinetto arrosto (*Porcheddu*) è uno dei piatti tradizionali della Sardegna più apprezzati, questo è ottenuto da animali macellati a 8-12 kg di peso vivo. La modalità tradizionale di cottura richiede tempi lunghi di preparazione pertanto il suo consumo è limitato alle occasioni in cui si dispone di tempi adeguati (la cottura dura circa 2 ore). Il *Porcheddu* è apprezzato sia dai consumatori sardi che dai turisti, inoltre è sempre più crescente la richiesta da parte dei mercati extra regionali. Sebbene, a causa della presenza della peste suina africana (PSA), non sia consentito il commercio dei suini e dei loro prodotti dalla Sardegna, la Direttiva 99/2002/EC prevede la deroga all'esportazione purché tali prodotti siano stati sottoposti a determinati trattamenti che eliminino l'eventuale presenza del virus della PSA. Tra i vari trattamenti previsti dalla normativa, per questo lavoro, è stato considerato il seguente: *Trattamento termico a una temperatura minima di 80 °C che deve essere raggiunta nell'intera massa della carne; in caso di carne che includa ossa lunghe, tale carne deve provenire da carcasse di peso non superiore agli 8 Kg*. L'obiettivo di questo studio era di valutare un processo innovativo per ottenere il piatto tradizionale *Porcheddu* in grado di raggiungere i mercati extraregionali e di soddisfare le richieste del consumatore moderno sempre più attento ai prodotti legati alla tradizione e alla qualità. Inoltre, si è valutato l'effetto del diverso peso della carcassa sulle rese di trasformazione dei suinetti sottoposti a trattamento termico per ottenere il suinetto arrosto precotto.

PAROLE CHIAVE AGGIUNTIVE

Cottura al forno.
Salagione.
Peste Suina Africana.
Trattamento termico.

INFORMATION

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INTRODUCTION

Swine presence in Sardinia since the early Neolithic is clearly documented by several zoo-archaeological studies (Wilkens 2003; Albarella et al. 2006). At this time the structural data of swine farming in Sardinia is represented by about 170,000 pigs, of which about 62,000 are breeding sows, reared in about 15,000 farms. A very relevant output of swine farms in Sardinia is

the suckling piglet (*Porcheddu*) that is slaughtered to obtain meat used to be roasted and prepare one of the most representative dish of regional cuisine (La Marmora 1826; Porcu 2014). These piglets are sacrificed when they are about a month old and have reached a body weight of 7-12 kg. The traditional preparation of roasted suckling piglet is relatively long (cooking time of about 2 h) and its consumption is appreciated by both local and foreign consumers and takes place in

agritourisms, restaurants of local specialties or during family lunches. However, there is also an increasing interest, for this traditional dish, by extra regional consumers and markets.

Actually, since the occurrence of African swine fever (ASF), the trade of pigs and pig meat products is not permitted from Sardinia; the Council of the European Union (Council Directive 2002/99/EC) provided a derogation for states member to authorise the production, processing and distribution of products of animal origin when a "Heat treatment at a minimum temperature of 80 °C, which must be reached throughout the meat» is applied as treatment to eliminate ASF risks. This precooking heat treatment is implemented in the extraordinary eradication program of the ASF 2015-2017, issued by the Regional Government (Regione Autonoma della Sardegna 2016) in order to export pork products. Thermal processing of Ready-to-Eat meat products is an innovative technology adopted to reach new markets with local foods and to comply with modern consumer choices.

The overall framework of this study was to evaluate an innovative process to obtain a traditional dish (*Porcheddu*) suitable to achieve extra-regional markets and to meet the demand of modern consumers. The specific objective of this paper is determine the effect of the different body weight of piglets on the final yield of cooking process used to produce ready-to-eat roasted piglet.

MATERIAL AND METHODS

Thirty male piglets at 30±2 days of age were chosen from litters of (Large White x Landrace) sows, artificial-

Table I. Yields value (%) in the preparation of *Porcheddu* of different body weight classes (L=7 to 9.5 kg; H=10 to 12.5 kg) (Rese (%) di preparazione del suinetto (*Porcheddu*) a differenti classi di peso vivo (L=7 a 9.5 kg; H=10 a 12.5 kg).

	H	L	P-value
Body weight, kg	11.24	8.09	<0.0001
Carcass weight at 45', kg	8.63	6.69	<0.0001
Hot carcass dressing, %	76.90	82.75	<0.0001
pH ₁ at 45'	5.90	5.88	0.831
pH _u at 24h	5.76	5.86	0.089
Carcass weight at 24h, kg	8.29	6.44	<0.0001
Cold carcass dressing, %	73.86	79.69	<0.0001
Weight of half carcass, kg	3.74	2.96	<0.0001
Weight of flavoured half carcass, kg	3.65	2.94	<0.0001
Weight of cooked half carcass, kg	3.04	2.49	<0.0001
Weight loss of process, kg	0.70	0.47	<0.0001
Total process yield, %	81.17	84.08	0.008

ly inseminated with semen of Piétrain boars, reared in a commercial farm. Piglets were individually weighed and sorted in two groups (15 animals/ each) according to their body weight (L = 7 to 9.5 kg and H=10 to 12.5 kg, respectively). All animals were sacrificed by exsanguination following electrical stunning.

Hot carcass weight was recorded and muscle pH and temperatures were measured in the *Longissimus dorsi* muscle at 45 min (pH₁) and at 24 h (pH_u) postmortem. Carcasses were chilled in the refrigerator, for 24 h at 4 °C temperature, and the measures were repeated before their split into left and right side.

All right sides of carcass were weighed, flavored with salts and spices, and aged in cold room at about 4°C for 24 h then re-weighed to evaluate the salting loss. Each half carcass was put in a ventilated oven until the temperature reached 80°C (figure 1) at bone level (femur). Each half carcass was immediately cooled placing them in a chiller at 3-4°C for 24 h, then vacuum packed and immersed in a water bath at 90°C for about 5 sec, and finally stored at 4°C for the shelf-life evaluation (Comunian et al. 2016).

The analysis of variance (ANOVA) was performed considering the effects of body weight on all measures.

RESULTS AND DISCUSSION

Results (**Table I**) showed a negative effect of BW on hot (76.9 and 82.7% for H and L, respectively) and cold (73.9 and 79.7% for H and L, respectively) carcass dressing percentages. The decrease of carcass dressing percentage with BW implies that the carcass components of H piglets had a lower increase than the gut components. Weight losses due to flavoring and cooking processes were higher for H carcasses. The total process yield of the ready-to-eat product was higher (p=0.008) in L than in H carcasses (84.1 vs 81.2%, respectively). The higher weight loss observed in *Porcheddu* of the H carcasses is probably due to a greater amount of fused fat during cooking technique.

This preliminary study on the production of the *Porcheddu*, and the positive results of the study on the shelf life of this product (Comunian et al. 2016) lead us to further research to improve and standardize a ready-to-eat dish for the regional and extra-regional market, in order to increase the profitability of a traditional dish by using innovative processes.

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Figure 1. Heat treatment of *Porcheddu* during cooking time into the oven (Trattamento termico del suinetto (*Porcheddu*) durante la fase di cottura in forno)

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