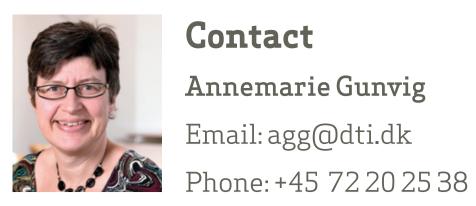


DANISH MEAT RESEARCH INSTITUTE





# How to make safe, juicy and rose beef patties



## Annemarie Gunvig, Tomas Jacobsen and Mari Ann Tørngren

## Introduction

Prolonged cooking of meat at a low temperature (LTLT) is ideal for:

- Reducing toughness and cooking loss
- Improving juiciness
- Obtaining a rose colour in the centre of the meat

## Food safety

Combining temperature with the right time, the treatment ensures a 4

# Results

Table 1. Log reduction of *L. monocytogenes* in beef patties at  $T_c^1$  and after the specific holding time at 53°C, 58°C, 60°C and 63°C (n=3)

Temperature °C	Reduction at Tc <sup>1</sup> Log	Holding times <sup>2</sup> Minutes	Total process time Minutes	Total reduction Log
53	0.5	300	322	> 6.7
58	1.1	30	53	> 6.7
60	2.7	20	44	> 6.7
63	4.6	3	31	> 6.7

log reduction of *L. monocytogenes*, equal to high food safety.

# Materials and methods

## Safety:

• Inoculated of beef patties in the geometric centre with a green coloured 5-strain cocktail of *L. monocytogenes*.



- Heat treatment of vacuum-packed samples heat treated in a water bath at 53°C, 58°C, 60°C or 63°C.
- Analysis of L. monocytogenes (Oxford, 48 h at 37°C) three times during heat treatment.

### Sensory analysis:

1  $T_c = Time$  until the heat treatment temperature is reached in the core. 2 Holding time = Time at the specific temperature

Temperature	55°C	60°C	75°C
Appearance		<image/>	
Juiciness***	7.3b	6.9b	3.1a
Doneness***	1.9b	2.1b	10.6a
Moisture loss (%)	8.5	12.9	22.8

## Conclusion

LTLT cooking of beef patties at 53°C, 58°C, 60°C or 63°C with holding times of

Beef patties heat treated at 55°C, 60°C and 75°C were evaluated on a 15-point unstructured scale anchored at the extremes (0 = low intensity and 15 = high intensity) by an 8-member trained sensory panel.

#### **Moisture loss:**

Patties were weighed before and after sous-vide cooking and before and after frying.



300, 30, 20 and 3 min, respectively, ensured more than 4-log reduction of strains of *L. monocytogenes* with a mean D-value.

Heat treatment of beef patties at 55°C and 60°C (220 and 27 min, respectively) resulted in juicier and less crumbly beef patties with a rose-coloured centre and 10-14% lower moisture loss compared with 75°C.