

EFFECT OF ARGON GAS ON SLICED ICEBERG LETTUCE DURING STORAGE

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Introduction

The change in consumer habits has resulted in an increased demand for lettuce. The increased demand also requires an increase in storage potential. The shelf life of sliced, washed salads is extremely short. It ranges from a few days to a maximum of a week. Extending the shelf life by one or two days is also a step forward for these products. According to some studies, argon gas used in modified atmosphere packaging positively affects the shelf life of sliced salad. In our study, we used a mixture of different concentrations of argon gas for the MAP packaging of the products. Microbiological parameters were examined during a two-week storage experiment. Our goal was to determine the effect of Argon gas on the quality of sliced salads during storage.

Materials and methods

Raw material: Sliced iceberg lettuce - 20mm

Weight of package: 200 gramm

Packaging material: 35m Antilopp BOPP

Gas mixtures:

- 2%O₂ in Nitrogen - Control
- 4%Ar, 2%O₂ in Nitrogen – AR4%
- 10% Ar, 2% O₂ in Nitrogen – AR10%
- 20% Ar, 2% O₂ in Nitrogen – AR20%

Storage of finished products at 4°C for 8 days.

Microbiological tests / methods 1 day after the expiry of the normal quality preservation period (8 days after packaging):

- Total microbial count (TPC)
 - MSZ EN ISO 4833-1:2014
- E.Coli
 - MSZ ISO 16649-2:2005
- Listeria Monocytogenes
 - MSZ EN ISO 11290-2:2017
- Salmonella
 - MSZ EN ISO 6579-1:2017
- Staphylococcus aureus
 - MSZ EN ISO 6888-1:2008

Objective

- MAP packaging of Eisberg salads with Argon gas mixture of different concentrations
- Microbiological examination after storage
- Comparative analysis with the control group
- Sensory test



Examined parameter	Sample name Control	Sample name AR-4%	Sample name AR-10%	Sample name AR-20%
TPC	2,2x10 ⁶	1,8x10 ⁶	1,3x10 ⁶	1,2x10 ⁶
E.coli	<10	<10	<10	<10
Listeria monocytogenes	<10	<10	<10	<10
Salmonella	Negative	Negative	Negative	Negative
Staphylococcus aureus	<10	<10	<10	<10

Result & Discussion

In all cases, the tests were carried out in an accredited laboratory. The samples were tested on the 8th day after packaging, at the end of the quality preservation period (P+8). The results of the microbiological tests show that there was no detectable difference between the samples tested.

Conclusion

Among the microbiological parameters, the TPC number in the tested product was slightly reduced by the use of gas mixtures with different Argon concentrations used during MAP packaging. In addition, it was confirmed that the samples were of good quality, fresh and crunchy even on the 8th day after packaging.