

# Test report (ADP\_Forensik\_1)

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Aging behaviour of plant parts in sealed  
airtight and breathable bags

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**Debatin products:**

Debasafe / Debabreathe (fleece) / Debabreathe (breathable material)

**Tested by:**

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**Date**

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## Preliminary remarks

Occasionally it happens that plant-based materials have to be stored as evidence. The material is first air-dried for 3-4 days, then sealed in the bag and placed in the inspection chamber. If airtight packaging is used, there is a danger that mould could form and thus destroy the evidence. Breathable materials not only reduce the formation of condensation, but also allow plant parts to dry further. The materials tested here, air permeable Breathe (porous polypropylene) and breathable material (non-woven textile fleece with polypropylene coating), exhibited specific air permeability as well as permeability to water vapour (see in table 1). These fleeces completely line one side of the bag, resulting in breathable bags which consist 50% of standard film and 50% of the air permeable materials Breathe or breathable material.

Table 1: Permeation properties of the breathable materials

Breathable material	Permeability to water vapour, g/m <sup>2</sup> /24h	Bendtsen air permeability test, ml/min
Breathe	<b>574</b>	<b>499</b>
Breathable material	<b>221</b>	<b>1.6</b>

## Task

The following test aimed to show whether using breathable materials can prevent the development of mould.

Test conditions were selected which would be more likely to induce the development of mould (storage at 37°C).

## Experiment:

As plant-based test material, 300g rocket salad was air-dried for 3.5 days. The remaining 50g was divided into 3 equal parts and sealed inside the three bags for testing (2x breathable Breathe & breathable material bags; 1x airtight polyethylene). The sealed bags were stored at 37°C and 50% relative humidity for 2 weeks. This temperature is ideal for the growth of fungi and/or mould.

The stored salad was then taken from the bags and examined for mould and water loss.

## Result:

The pre-dried plant-based evidence was leathery and flexible, so had not dried out completely. Following storage, the plant-based evidence was examined optically and weighed again to determine water loss.

Table 2: Results of the storage test

Packaging	PE/PE	PE/Breathable	PE/ Breathable material
Mould	Heavy mould growth (ill. 3)	No mould growth (ill. 2)	No mould growth (ill. 1)
Degree of dryness in comparison to pre-dried state	Unchanged	Much dryer; plant-based evidence was brittle and inflexible	Much dryer; plant-based evidence was brittle and inflexible
Additional loss of mass in %	0	28	25



Ill. 1: Rocket salad following storage in PE/ breathable material bag, picture on right shows enlargement



Ill. 2: Rocket salad following storage in PE/fleece bag, picture on right shows enlargement



Ill. 3: Rocket salad following storage in airtight PE bag, picture on right shows enlargement



### **Conclusion:**

If stored in airtight packaging, plant-based evidence shows a distinct tendency to develop mould.  
The packaging with breathable material / Breathe lining on one side of the bag allowed residual water to evaporate through the packaging and thus prevent the development of mould.

Dr.-Ing. Oliver Tröber, 15.12.2014