



## Wood in contact with food



*Wood in contact with food is traditionally used not only in packages of single use or reusable packaging but also in cutting boards and countertops, utensils and kitchen utensils, kebab skewers, toothpicks, ice pops, wine barrels, etc., etc. If we rely on all these products, why not do it in packaging?*



### **POROSITY, MORE PROS THAN CONS**

The wood structure is complex, and yes, mostly porous. Capillary properties and ability to retain moisture in the fibers (hygroscopic), far from being a problem, impart desirable properties. It is well worth its freshness and storage capacity, but people are often unaware of their positive antibacterial effect.

There are numerous studies on microbial contamination in terms of cross contamination, especially with cutting boards comparing different species of wood (ash, linden, beech, walnut, birch, cherry, balsa, maple, oak, etc.) with polypropylene or polyethylene, stainless steel or ceramics.

Different studies on bacteria and different wood surfaces behave identically about pollution, whatever type of wood. Differentiation of wood versus other materials is based on its porous structure, and the physical inhibitory effect of capillarity and moisture.

### **Food Safety**

#### **What foods are packed in wood?**

Fruits and vegetables, fish and seafood, wines and liquors, oils, cheeses and dairy products, meats and sausages, breads and pastries, nuts. France renowned for its food traditions, has regulated most of these uses.

#### **Are all the species of wood suitable?**

To give some examples, France authorizes woods: birch, fir, Douglas fir, acacia, poplar, alder, aspen, hornbeam, chestnut, ash, olive trees, maritime pine, Scots pine, bananas (sycamore), and oak. United States manufactures kitchenware of wood: coconut, cherry, mahogany, poplar, walnut, teak, maple, oak, mulberry, pear, elm, apple, yew, etc.. And cutting boards with ash, balsa, basswood, beech, birch, walnut, maple, etc. Fir, willow, beech or birch with basswood and alder, are considered suitable even for fatty foods.

#### **What do scientists say?**

However, there are many studies on the hygienic properties of wood, which confirm that wood is as good as other materials for use in the food industry, either on pallets, packages or containers. Various characterizations of wood cutting boards, countertops, pallets, etc. highlight its bactericidal effect by "physical inhibition", although experts believe the need for greater harmonization of the methodologies used.



# Antibacterial effect

## Porosity and Antibacterial effect

The rapid disappearance of surface contamination in the timber poses a lesser risk of cross contamination to other non-porous surfaces such as plastics.

The wood packaging for single use and dry is not conducive to the propagation or survival of micro-organisms (Ak et al. 1994a, 1994b; Abrishami et al. 1994; Revol-Junelles et al. 2005)

Chiu et al, Schönwälder et al, Moore et al, Gough et al, and Milling et al, also concluded that: the wood surface leads to decreased proliferation of inoculated pollutants than other surfaces, and reduces the survival time of bacteria in wood. This is more evident the higher the pollution in amount and duration is. Schönwälder et al in 2002 concluded that these properties are independent of the age of the wood.

The Danish Technological Institute ([www.teknologisk.dk](http://www.teknologisk.dk)), leading a broader joint research with research institutes in Nordic, German and Switzerland, inoculated bacteria similar to Salmonella Listeria.en Camphylobacter in different species of wood (oak, pine, Nordic fir, beech and ash) in cutting boards, pallets, containers of fish and food packaging, comparatively with plastic and steel, concluding in a superior bactericidal effect of the first.

More information : [www.fedemco.com](http://www.fedemco.com) & [www.fefpeb.eu/wood-food](http://www.fefpeb.eu/wood-food)



Re-use is more widespread in industrial packaging, for example agricultural box pallets, or in pallets where there is no direct contact with food.

The Danish Technological Institute, studied the incidence of bacteria on pallets used in 14 food industries. The bacterial count on the pallets of different wood species showed to be on average 15% lower than on plastic pallets. The study concluded that wood is a hygienic material because it kills bacteria.

## Bactericidal effect

The wood structure is not the only criterion of differentiation in their response to pollution, since the presence of certain molecules and the chemical composition, are even more than a factor in this differentiation, according to Schönwälder et al in 2002 and Milling et al in 2005

Scots pine show a strong antibacterial power (Välismaa et al in 2007), higher than other wood and plastic. In poplar similar properties are observed, and slightly above to polyethylene.

“Wooden crates ensure hygienic protection when distributing fruit and vegetables products as they are for a single use and the wood has antibacterial properties”

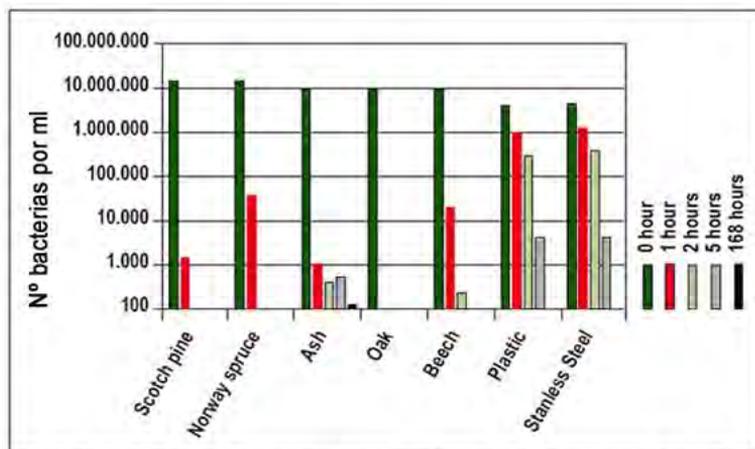


Gráfico 1: Palets en la industria agroalimentaria. Fuente: Danish Technological Institute.