

Going Back to Nature: Wood as Enrichment

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The benefits of using wood as enrichment

Environmental enrichment can be defined as altering the living environment of captive animals in order to provide them with opportunities to express more of their natural behavioural repertoire¹. The challenge of providing effective enrichment in laboratory species is to ensure the enrichment allows for normal behavioural opportunities, including foraging, sheltering, exploring, nest building, and gnawing. In the wild, many species use wood and bark to satisfy these behaviours, thereby maintaining physiological and behavioural health. For laboratory animals, a variety of wood enrichment products are available that provide appropriate environmental enrichment.

SOFTWOOD OR HARDWOOD?

There two wood types: softwood and hardwood. The distinction between hardwood and softwood actually has to do with how the plant reproduces. Softwood is a generic term for wood from conifers. The term softwood designates wood from gymnosperm trees or plants having seeds with no covering, such as pine, spruce, cedar, fir, douglas-fir, hemlock, cypress and yew. The term hardwood designates wood from broad-leaved, mostly deciduous, angiosperm trees or plants that produce seeds with some sort of covering. Examples of hardwood trees are oak, maple, birch, aspen and poplar.

Despite what their names would suggest, a hardwood is not necessarily a harder material (more dense) and softwood is not necessarily a made up of softer material (less dense). For example, balsa wood is one of the lightest, least dense woods there is, and it is considered a hardwood.

When choosing what kind of wood to use in an environmental enrichment program, the most important safety concern is the characteristic aroma of softwoods. This comes from aromatic (volatile) hydrocarbons. Studies have demonstrated these induce liver microsomal enzymes, increase incidence of cancer and are toxic to cells. One of the first studies regarding the effects of softwood bedding on liver function found that use of softwood bedding significantly increased the production of liver microsomal enzymes². Because of this, hardwoods are safer, create less experimental variables and are used extensively in research as bedding, nesting material and as forms of enrichment.

GNAWING ENRICHMENT

Many wood enrichment products are available to meet a variety of protocol requirements. For use in strict GLP and Tox Programs, Certified (Contaminant Screened) clean hardwood blocks are certified not to exceed maximum concentrations of key contaminants such as heavy metals, aflatoxins, chlorinated hydrocarbons and organophosphates and are available in three sizes to

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accommodate mice, rats, rabbits and guinea pigs.

All of the aforementioned species have open rooted dentition and their teeth continuously grow throughout their life. Wood provides safe natural gnawing enrichment, which supports excellent dental health, is inexpensive for cost-conscious budgets and can be autoclaved for use in barrier operations.

Hardwood blocks can also be used as proactive enrichment to reduce atypical convalescence issues and discomfort/distress while facilitating quality care. A report by Kimberly A. Wasko, CVT, VTS, RALAT, Department of Surgery, Drexel University, College of Medicine, Philadelphia, PA, USA demonstrated remarkable results; 98% of animals (rats) experienced substantially decreased complications, such as weight loss, dehydration, lethargy and dull mentation when they were provided treat enrichments and hardwood blocks after surgery³.

Others use hardwood chunks with holes to hide treats to decrease inter-mouse aggression. The mice search for the treats and gnaw on the wood instead of fighting with their cage mates.

VARIETY AND NOVELTY

For primates, wood enrichment is a way to provide variety and novelty. Wood enrichment stimulates the expression of species-specific behaviours such as gnawing, foraging and perching and promotes exploratory and play behaviour.

In the wild, primates spend a major portion of their day gathering and working for food. Foraging activity takes up to more than 60% of a primate's awake time depending on the availability of food in the environment⁴. Furthermore, studies have shown primates would rather work for food versus having it readily available such as in a standard feeder⁵. Promoting foraging activities in a research environment affords primates an opportunity for exercise and mental stimulation. Hiding food and foraging treats in hardwood chips or shavings will keep them busy for hours.

Other ways of promoting foraging and exploratory behaviours is to hide treats inside wood sticks. A variety of hardwood saplings or splits and manzanita sticks can be pre-drilled with holes and filled with pure acacia gum or the acacia gum can be mixed with foraging bits and/or flavoured with juice for added variety. Acacia gum is a natural product harvested from the sap of acacia trees and processed into a powder form. Water or juice is added to acacia gum powder to obtain the desired sticky consistency. The combination of acacia mixed with a wide variety of foraging treats stimulates the palate of primates to promote foraging behaviour.

Primates are naturally curious and providing wood enrichment is an inexpensive, safe and long-lasting way to keep them occupied. Unlike commercial toys, hardwood branches or sticks do not lose their novelty effect over time because they change their shape, colour and texture due to wear and progressive hydration. Wood enrichment promotes several primate behaviours including gnawing, manipulating, chewing, perching and playing.

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SAFETY FIRST!

The most important consideration when offering any enrichment products is safety of the animal. Opponents of wood use have raised concerns of it splintering or being a choking hazard; however, those concerns have been speculative at best.

Reinhardt reported that long-term use of hardwood sticks by hundreds of rhesus macaques resulted in no recognisable health hazards⁴. Use common sense for the cleaning and replacement of soiled wood as needed.

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