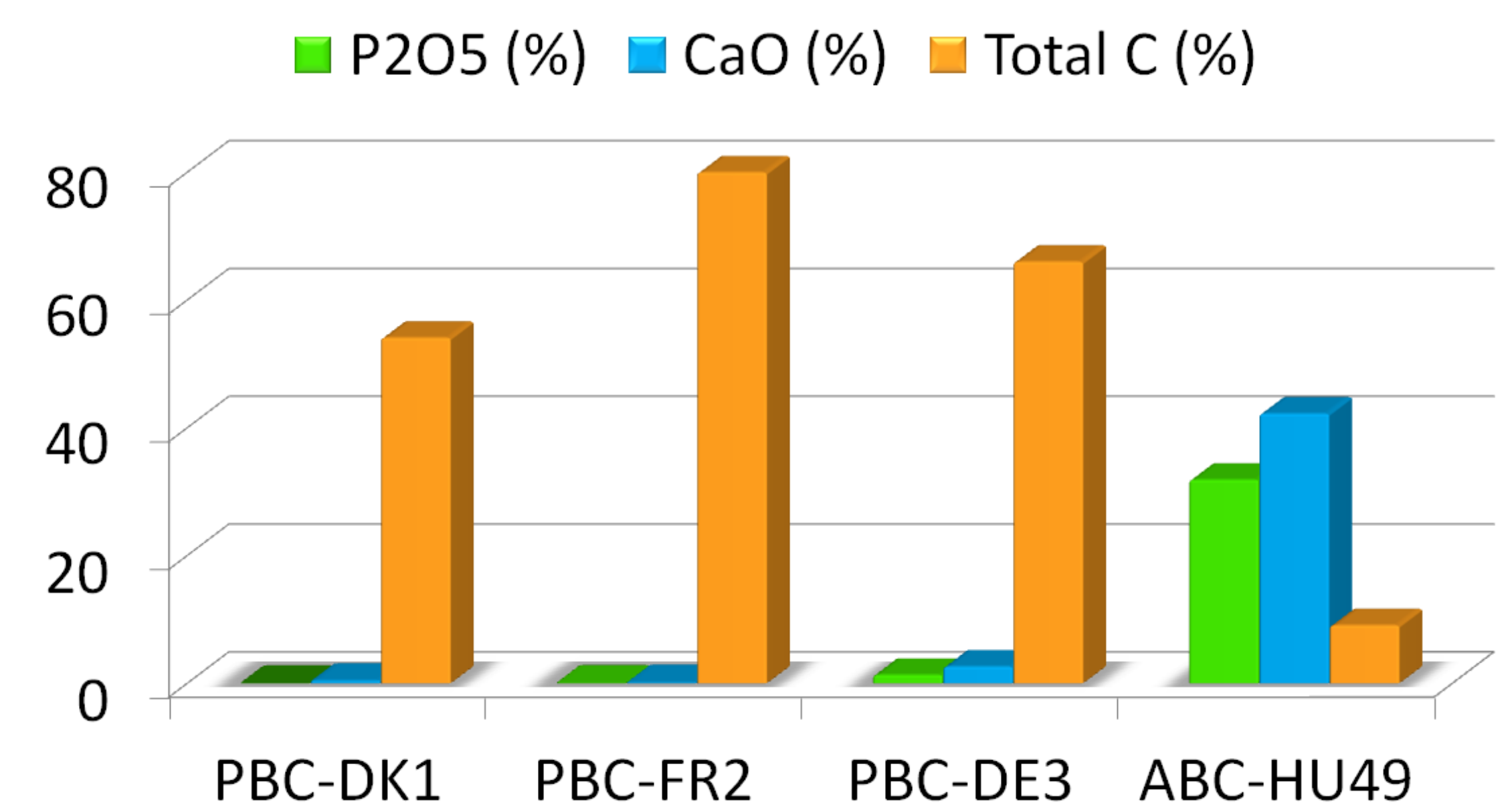


## ACCREDITED ANALYSIS OF BIOCHAR SAMPLES IN THE FRAME OF REFERTIL PROJECT

### EVALUATION OF BIOCHAR QUALITY IN THE PROJECT

**By Wessling Hungary Ltd., an accredited laboratory partner of the REFERTIL project hundreds of different types of biochar and test samples from 11 countries have been investigated.**

With high number of tests the quality of the input materials and the output products were fully characterised. Measurements were directed on one hand to examine useful plant nutrients, phosphorus - carbon - nitrogen content and on other hand to the detection of potential risk factors such as Polycyclic Aromatic Hydrocarbons (PAHs), Potentially Toxic Elements (PTEs), Polychlorinated Biphenyls (PCBs) and dioxins. The priority hazardous substances PAHs are key targets to determine any biochar product quality and safety, while providing full information on pyrolysis processing technology efficiency and performance.



### ACCREDITED BIOCHAR ANALYSIS AT WESSLING HUNGARY LTD.

The Environmental Testing Laboratory of WESSLING Hungary Ltd. is the first laboratory in Europe obtained accredited status for comprehensive analyses of biochar samples in 2014, revised in 2015 under **WESSLING-NAT-1-1398/2015**.

### ANALYSIS FOR SAFE BIOCHAR PRODUCTS

**During pyrolysis and other thermal treatment processes PAHs are the main indicator contaminants, it's limit value has been defined as maximum 6 mg/kg for biochars.** With various biochar processing conditions it has been verified that the technology influences the quality of the product.

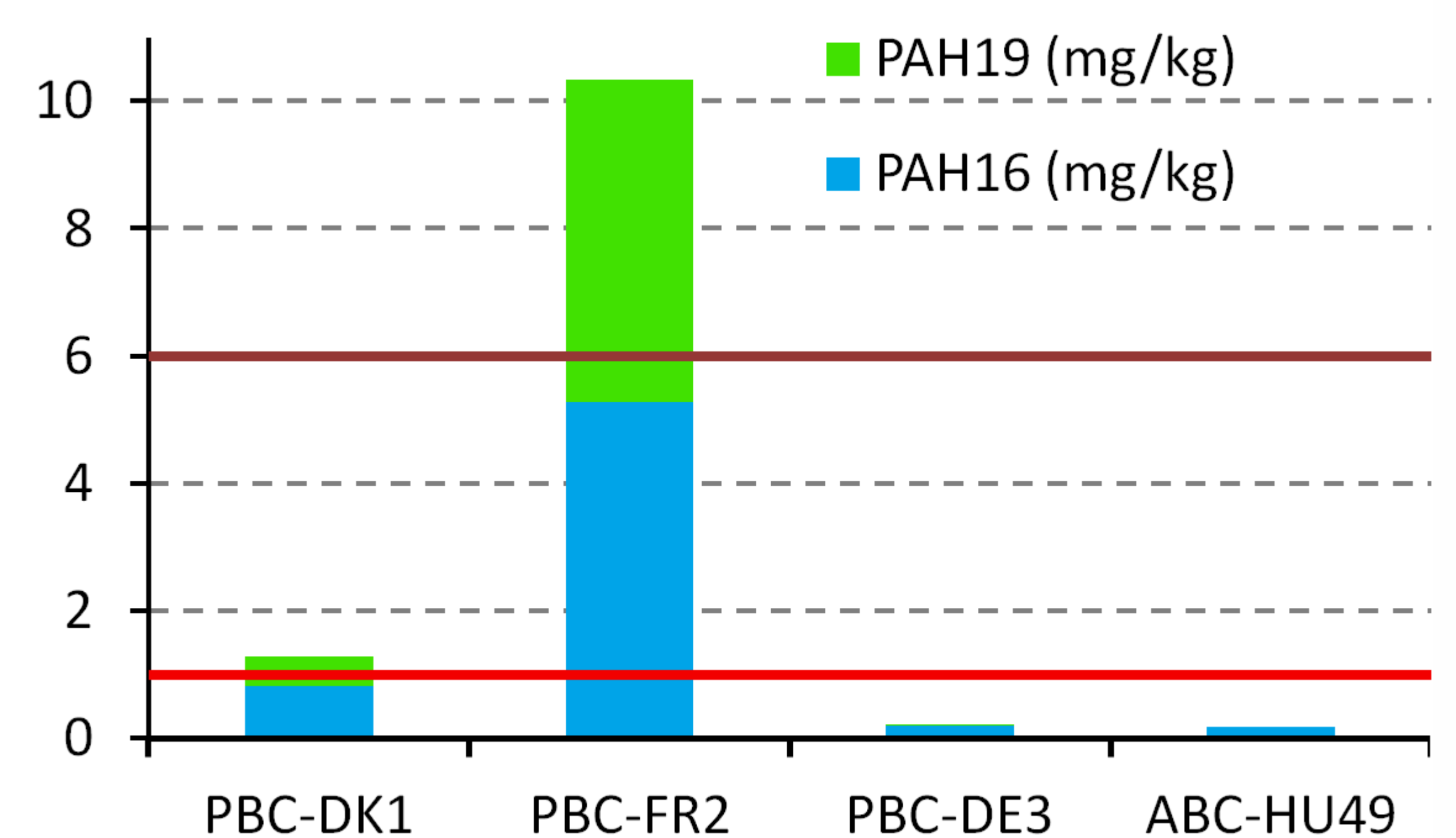
In spite of their similar visual appearance, the microstructure and chemical properties of the plant based biochars (PBC) and Animal Bone bioChars (ABC) are quite different but they can be analysed using the same laboratory methods. Between appropriate treatment conditions, high quality biochars were made with low PAH19 content (<1 mg/kg), that is already mandatory regulated and applied by some MS for soil improvers since 2006.

PCBs were not detected from any biochars, but high chlorine content of the input material was also not expected. As dioxins is not detected in biochars, we have concluded that PCB presence is a good indicator of these persistent and bioaccumulative chemicals.

Measuring Potentially Toxic Elements in biochars is very important, because during processing one part of the organic compounds in feed material transforms to oil and gas. This results much higher PTE concentration in products. The higher the organic matter content in feedstock, the less the yield of biochar, thus PTE accumulation occurs especially in PBCs.

### BIOCHAR BENEFITS IN SOIL

ABC products containing >30% P<sub>2</sub>O<sub>5</sub> and >40% CaO so these are effective as fertiliser. PBC has negligible nutrient content but high (55-80%) total carbon content. Along with its microporous structure it is a good soil amendment.



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