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**Influence Of Plant Oil Properties On
Performance Of Pressure Stoves**

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At the Universität Hohenheim (Stuttgart, Germany) a plant oil pressure stove was developed in cooperation with Bosch und Siemens Hausgeräte GmbH (Munich, Germany). The stove shows satisfactory performance and reliability; however, combustion deposits are formed inside the vaporizer when using pure plant oil as fuel. This can lead to deposits in the vaporizers pipe and nozzle, as well as a decrease in power of the stove. Formation of deposits in plant oil pressure stoves depends on the plant oil type and degree of refining. As a consequence, the vaporizer has to be cleaned periodically, which is creating extra work load for users. In this thesis the influence of different oil quality parameters, on deposit and performance of plant oil pressure stoves were investigated. Plant oil with different fatty acid composition and different quantities of free fatty acid content, phosphorus content and content of calcium and magnesium were provided and tested in a plant oil pressure stove. Furthermore, the influence of variable properties of *Jatropha curcas* oil on formation of deposits in plant oil pressure stoves was investigated.

Increasing iodine number did not influence the efficiency of plant oil pressure stoves as indicated by the specific fuel consumption. However, a higher iodine value leads to a higher amount of deposits in the vaporizer of plant oil pressure stoves. The content of free fatty acid of plant oil did not influence the efficiency of plant oil pressure stove. Decreasing heating value due to increased content of free fatty acids of test fuels leads to a reduction of power output. Furthermore, a higher content of free fatty acids in plant oil leads to a higher amount of deposits in the vaporizer. With increasing phosphorous content of plant oil more deposits were formed inside the vaporizer. Higher content of phosphorous cause's pressure peaks in the vaporizer, which lead to higher fuel consumption. With increasing calcium and magnesium content, more deposits were formed inside the vaporizer and this influence the formational behaviour of deposits and consequently necessitate regular cleaning of the clogged nozzle. Influence of various *Jatropha* oil parameters on deposit formation in a plant oil pressure stove were given by a model based on the oil quality parameters acid value, water content and ash content which was useful for the prediction of deposit accumulation inside the vaporizer of the plant oil pressure stove.