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# 1 **Viscoelastic behavior of maize kernel studied by dynamic mechanical** 2 **analyzer**

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## 13 **Abstract**

14 The creep recovery, stress relaxation, temperature-dependence and their frequency-dependence  
15 of maize kernel were determined within a moisture content range of 11.9% to 25.9% (w/w) by using  
16 a dynamic mechanical analyzer. The four-element Burgers model was found to adequately represent  
17 the creep behavior of the maize seeds ( $R^2 > 0.97$ ). The 5-element Maxwell model was able to better  
18 predict the stress relaxation behavior of maize kernel than the 3-element Maxwell model. The  $T_g$   
19 values for the maize kernels decreased with increased moisture content. For example, the  $T_g$  values  
20 were 114°C and 65°C at moisture content values of 11.9% (w/w) and 25.9% (w/w), respectively. The  
21 magnitude of the loss moduli and loss tangent and their rate of change with frequency were highest at  
22 20.7% and lowest at 11.9% moisture contents. The maize kernel structure exhibited A-type

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