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## Effects of sieve size on chipper productivity, fuel consumption and chip size distribution for open drum chippers

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Chip size distribution is an important quality variable not only for buyers of forest fuels, but also for chipping contractors as it influences both fuel consumption and productivity of chippers. Studies of disc chippers and of drum chippers with closed drums have shown that increased chip target length increase chipper productivity and decrease fuel consumption per ton of chips produced. For open drum chippers, chip length is partly controlled by the mesh size in the sieve. In order to evaluate how this sieve affects productivity and fuel consumption of chippers, two open drum machines for professional chipping of forest fuels were studied. Small chippers were represented by a Kesla 645, and larger ones by an Eschböck Biber 92. The Kesla 645 was studied with 25, 50, and 100 mm sieves and the Biber 92 with 35, 50, and 100 mm sieves. With the 100 mm sieve the Kesla chipper produced 14.5 oven dry ton (odt) of chips per effective hour and the Biber 30.0 odt per effective hour. Fuel consumption per odt was 3.0 l for the Kesla and 2.1 l for the Biber. A reduction of sieve mesh size decreased productivity and increased fuel consumption for both machines. Reducing the mesh size decreased the size of produced chips for the Kesla, but not for the Biber. The sieve on the Biber seems to be a safety measure against oversized pieces whereas chip size is, as on a closed drum chipper, mainly controlled by the cut length of the knives.