Fluidized bed drying using superheated steam was used to reduce the moisture content of the product from 45% dry basis to 16-28% dry basis. The conditions conducted in this experiment were the initial moisture contents of paddy of 25-45% dry basis, bed heights of 10, 12.5 and 15 cm, and the temperatures of 150 and 170 °C with constant pressure of 106.1 kPa. The effect of inlet superheated steam temperature on the removal of moisture was much more significant than that of bed height. It was possible to reduce the high moisture content of the paddy down to 18% dry basis with capable of maintaining the quality of the paddy in terms of head rice yield. Comparing to previous works on fluidized bed drying using hot air, the paddy dried with superheated steam has approximately 30% higher quality of head yield. It was also found that the initial moisture content had a significant effect on the white belly of rice product.