

20 % for *Tectona grandis*, 17 % for *Acacia nilotica*, 24 % and 20 % for *Azadirachta indica*, 23 % and 18 % for *Eucalyptus tereticornis* over bore well water irrigation. At 6 MAP, the percent in height and basal diameter was 7 % each for *Casuarina equisetifolia*, 13 % and 6 % for *Tectona grandis*, 13 % and 6% for *Acacia nilotica*, 15 % and 9 % for *Azadirachta indica*, 14 % and 12 % for *Eucalyptus tereticornis* under sewage water irrigation over bore well water irrigation.

At 9 MAP, the increase in height and basal diameter was 8 % each for *Casuarina equisetifolia*, 9 % and 6 % for *Tectona grandis*, 12 % and 9 % for *Acacia nilotica*, 10 % and 4 % for *Azadirachta indica*, 21 % and 11 % for *Eucalyptus tereticornis* over bore well water irrigation. At 12 MAP, increase in height and basal diameter was 7 % and 4 % for *Casuarina equisetifolia*, 7 % and 4 % for *Tectona grandis*, 6 % and 4 % for *Acacia nilotica*, 47 % and 4 % for *Azadirachta indica*, 8 % and 7 % for *Eucalyptus tereticornis* over bore well water irrigation. At 15 MAP under sewage water irrigation, the percent increase was 4% each for *Casuarina equisetifolia*, 5 % and 3 % for *Tectona grandis*, 6 % and 5 % for *Acacia nilotica*, 7 % and 5 % for *Azadirachta indica*, 10 % and 8 % for *Eucalyptus tereticornis* over bore well water irrigation.

From the study, it was found that sewage water can be better used for raising tree plantation on relatively unfertile wastelands through afforestation, urban forestry plantation, social forestry plantation to safeguard the planet earth from global warming, severe drought, adverse climatic condition, pollution etc.

### 071

## Utilization of oil palm waste as a low cost feed ingredient for growing pigs to reduce the environmental pollution

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Oil palm is the one of the most popular oil crop in many regions of the world and it plays an important role as a component of animal feed and as a cooking material in an industrial sector. However, every ton of oil produced generates tons of effluent and this cannot be released to the environment directly as it causes environmental pollution due to its high biological and chemical oxygen demand. Therefore, an experiment was conducted to investigate the potential use of oil palm decanter cake as an ingredient to prepare a low cost ration for 36 cross bred pigs (Land race\* Large white) using complete randomized statistical design. Four different ration such as 1:1 poultry offal and decanter cake (T1), 3:1 poultry offal and decanter cake (T2), commercial ration (T3) and mixed feed (poultry offal, decanter cake, rice bran and beer pulp; T4) were fed to pigs during growing stage. Growth performances; daily intake (DI), daily weight gain (DWG) and feed conversion ratio (FCR) were determined during the experiment and carcass quality parameters; carcass depth, carcass length, back fat thickness (BFT) and dressing percentage were measured at the end of the experiment.

Results demonstrated that the daily intake was highest ( $4.2 \pm 0.15$  kg/day) in pigs fed with T4 ration compared to the other rations due to nutrient imbalance with deficient residue composition. Although commercial ration shown that lowest intake and FCR ( $1.99$  kg/day and  $3.57 \pm 0.27$ ) together with highest weight gain ( $562.5 \pm 44$  g/day) mainly due to proper nutrient balance. Live weight, carcass weight and carcass depth of the pigs fed with T1, T2, and T3 rations were significantly different ( $P < 0.05$ ) than T4 which have the lowest value ( $81 \pm 5.17$  kg,  $62.33 \pm 4.64$  kg and  $33.33 \pm 0.67$  cm). However, carcass length of the animals was not significantly different ( $P < 0.05$ ) between four-treatment because the length mainly depends on genetic factors. Pigs fed with commercial ration shown that highest back fat thickness of  $4.47 \pm 0.39$  cm. Since, there is no significant difference ( $P < 0.05$ ) of the BFT among the treatments.

The results suggest that, in spite of the DWG and high FCR observed with T1 and T2, the carcass characteristics are not different as compared with pigs fed with commercial ration. Therefore, the results of this study conformed that decanter cake could be used as a substitute in pig rations to reduce the cost and also to utilize by product of oil palm effluent to minimize environmental pollution.