A microbial medium was formulated from food wastes that included defatted soya, potato solid waste, opaque beer spent grains and clear beer spent yeasts. A 3 M NaOH hydrolysis followed by a neutralization process using concentrated acid was used for standardizing and preparation of the medium. A pulverized medium named DYSP was produced that could be reconstituted without settable solids. The formulation was prepared with 1% (w/v) defatted soya flour, 1% (w/v) spent yeast 0.75% (w/v) potato solid waste flour and 0.375 % (w/v) pulverized opaque beer solid waste produced the highest microbial growth compared to synthetic media. All the test of preliminary medium formulations showed microbial growth support of E. coli, B. subtilis, B. thuringiensis, M. aureus, A. niger and S. cerevisiae. The DYSP medium had 35.45% protein, 5.7% nitrogen, 6.35% (w/w) ash, 8.6% moisture (w/w) and 0.012 mg/ml reducing sugar content. When reconstituted with distilled water its pH was 6.6. A reconstituted 1 % (w/v) DYSP medium supported microbial growth quite comparable to the commercial synthetic media types. There was no significant differences (P< 0.05) when DYSP medium was compared with nutrient agar and Sabouraud dextrose media for culturing bacteria and fungi cultures respectively. Traditional classical microbial studies demonstrated that the test cultures could grow and retain normal morphology on the DYSP medium. The DYSP medium was tested against commercial media for its capability to support growth of bacteria from soil and water samples. DYSP medium yielded significantly high bacterial counts of 3.0 ± 0.03 (log cfu/ml) compared to plate count agar, 2.95 ± 0.03 log cfu/ml and nutrient agar with 3.1 ± 0.1 log cfu/ml in the microbial analysis of natural samples( water and soil). DYSP medium proved to be an equally alternative medium in molecular biology and for studying as well as optimizing production of penicillin by Penicillium chrysogenum.