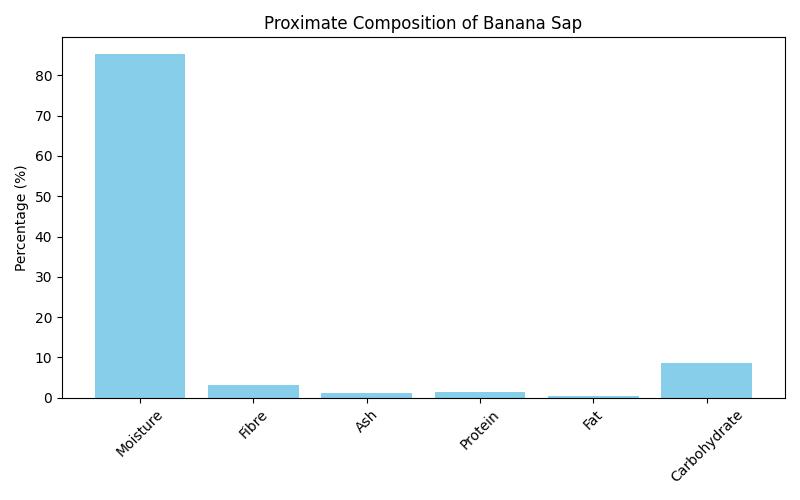
Analysis of Banana Sap Composition for Bioethanol Production

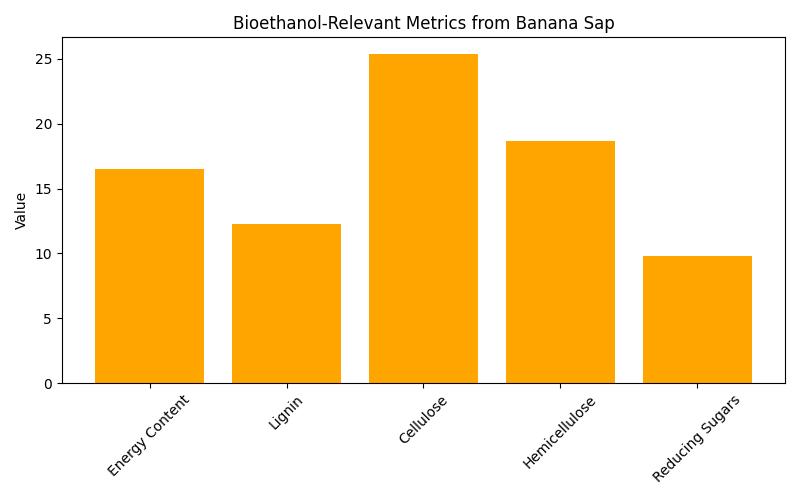
# Proximate Composition

|  |  |
| --- | --- |
| Component | Value (%) |
| Moisture | 85.2 |
| Fibre | 3.1 |
| Ash | 1.2 |
| Protein | 1.5 |
| Fat | 0.3 |
| Carbohydrate | 8.7 |



# Bioethanol-Relevant Metrics

|  |  |
| --- | --- |
| Component | Value |
| Energy Content | 16.5 |
| Lignin | 12.3 |
| Cellulose | 25.4 |
| Hemicellulose | 18.7 |
| Reducing Sugars | 9.8 |



# Discussion

The proximate composition of banana sap reveals a high moisture content (85.2%), which may influence fermentation efficiency. The fibre and carbohydrate levels suggest potential for microbial activity, while low protein and fat indicate minimal nutritional interference.  
  
Bioethanol-relevant metrics show substantial cellulose (25.4%) and hemicellulose (18.7%) content, which are key substrates for ethanol production. Lignin (12.3%) may pose a challenge due to its resistance to enzymatic breakdown. The energy content (16.5 MJ/kg) supports its viability as a biofuel source.  
  
Overall, banana sap demonstrates promising characteristics for bioethanol production, though pretreatment strategies may be necessary to overcome lignin barriers.