FYP Task 1: Dataset Analysis for Nutrient Detection from Food Images

# Table 1: Summary of Research Papers

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Title / Author / Year / Journal | Data Modality | Dataset(s) Used | Models Used | Evaluation Metrics | Target / Purpose | Limitations | Sr. No. |
| Computer vision and deep learning-based approaches for detection of food nutrients/nutrition Sushant Kaushal et al., 2024, Trends in Food Science & Technology | Image-based (Visual) | Food-101, UECFOOD100/256, Nutrition5k, FLD, VIREO Food-172, Custom HSI/NIR/MRI | CNNs, Transformers, Hybrid DL + ML | Accuracy, Precision, Cost-effectiveness, Speed | Non-destructive food nutrient detection & analysis | High cost, interpretability issues, poor real-world performance, lighting/image quality sensitivity | 1 |
| Image-based nutrient estimation for Chinese dishes using deep learning Peihua Ma et al., 2021, Food Research International | Image-based (Visual) | ChinaFood-100 (10,074 images) | Inception V3 (best), VGG, ResNet, GoogLeNet | Top-1 Acc: 78.26%, Top-5 Acc: 96.62%, R² = 0.73 | Image-based nutrient estimation for Chinese cuisine | Dataset limitation, generalizability, portion estimation challenges | 2 |

# Table 2: Public Datasets for Nutrient Estimation from Food Images

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dataset Title | Data Modality | Dimensions | Size | Source / Link | No. of Images | Limitations |
| Food-101 | Image | 101 classes, 101,000 images | 5.2 GB | https://www.kaggle.com/dansbecker/food-101 | 101,000 | Limited to Western foods |
| UECFOOD100 | Image | 100 categories | 2 GB | https://www.kaggle.com/ankurzing/uecfood100 | 14,000 | Japanese foods mainly |