API DOCUMENT

/detect

Response body :

Predict spoilage of open item -> apple using yolo in real time -> give prediction using spoilage\_cnn model -> stimulate sensor data -> dynamic pricing results.

All in one end point

**{**

**"detections": [**

**{**

**"box": [**

**1564,**

**834,**

**3712,**

**2471**

**],**

**"prediction": "freshapples",**

**"confidence": 0.006482426077127457,**

**"sensor\_data": {**

**"ethylene\_ppm": 0.41,**

**"temperature\_c": 22.8,**

**"humidity\_percent": 62.6**

**},**

**"pricing": {**

**"action": "sell",**

**"discount\_applied": true,**

**"discount\_percent": 4.1,**

**"price\_usd": 0.96,**

**"message": null**

**}**

**}**

**]**

**}**

/predict\_milk\_with\_spoilage

Response body:

Stimulate the different kind of milk in form of sku and predict their spoilage by assuming certain conditions.

**"sku": "whole\_milk\_1gal",**

**"spoilage\_data": {**

**"sku": "whole\_milk\_1gal",**

**"production\_date": "2025-05-31",**

**"expiry\_date": "2025-06-19",**

**"days\_past\_expiry": 10,**

**"pH": 6.06,**

**"bacterial\_load\_log\_cfu\_ml": 7.35,**

**"storage\_temperature\_c": 5.3**

**},**

**"prediction": "fresh",**

**"probability": 0.45512110762641994,**

**"pricing": {**

**"action": "sell",**

**"discount\_applied": true,**

**"discount\_percent": 10,**

**"price\_usd": 3.11,**

**"message": null**

**},**

**"explanation": "The spoilage prediction for whole\_milk\_1gal was determined using a logistic regression model, P(spoiled) = 1 / (1 + e^-(0.5\*days + (-1.0)\*pH + 0.8\*bacterial\_load - 5.0)), based on research indicating pH, bacterial load, and days past expiry as key spoilage indicators ([ResearchGate: Screening of Bacteria Responsible for Milk Spoilage]). For this sample, pH=6.06, days past expiry=10, and bacterial load=7.35 log CFU/mL yielded a spoilage probability of 0.46. Storage at 5.3°C and expiry date 2025-06-19 were considered. The prediction 'fresh' guides the action: sell with a discount for mildly spoiled milk, donate if usable but not sellable, or dump if unsafe, optimizing inventory for a retail store."**

**"sku": "skim\_milk\_1gal",**

**"spoilage\_data": {**

**"sku": "skim\_milk\_1gal",**

**"production\_date": "2025-05-18",**

**"expiry\_date": "2025-06-14",**

**"days\_past\_expiry": 15,**

**"pH": 5.51,**

**"bacterial\_load\_log\_cfu\_ml": 5.29,**

**"storage\_temperature\_c": 6.9**

**},**

**"prediction": "spoiled",**

**"probability": 0.772415320751363,**

**"pricing": {**

**"action": "sell",**

**"discount\_applied": true,**

**"discount\_percent": 36.3,**

**"price\_usd": 2.2,**

**"message": null**

**},**

**"explanation": "The spoilage prediction for skim\_milk\_1gal was determined using a logistic regression model, P(spoiled) = 1 / (1 + e^-(0.5\*days + (-1.0)\*pH + 0.8\*bacterial\_load - 5.0)), based on research indicating pH, bacterial load, and days past expiry as key spoilage indicators ([ResearchGate: Screening of Bacteria Responsible for Milk Spoilage]). For this sample, pH=5.51, days past expiry=15, and bacterial load=5.29 log CFU/mL yielded a spoilage probability of 0.77. Storage at 6.9°C and expiry date 2025-06-14 were considered. The prediction 'spoiled' guides the action: sell with a discount for mildly spoiled milk, donate if usable but not sellable, or dump if unsafe, optimizing inventory for a retail store."**

**}**

For different kinds of milk

All will be combined under one Fastapi -> app.py under these end points.

There response are also infuse with the dynamic engine which depict that whether to give discount ,donate or dump it.