

CLIMATE INTELLIGENCE FOR FOOD

Automating LCA Data for the Food
Industry

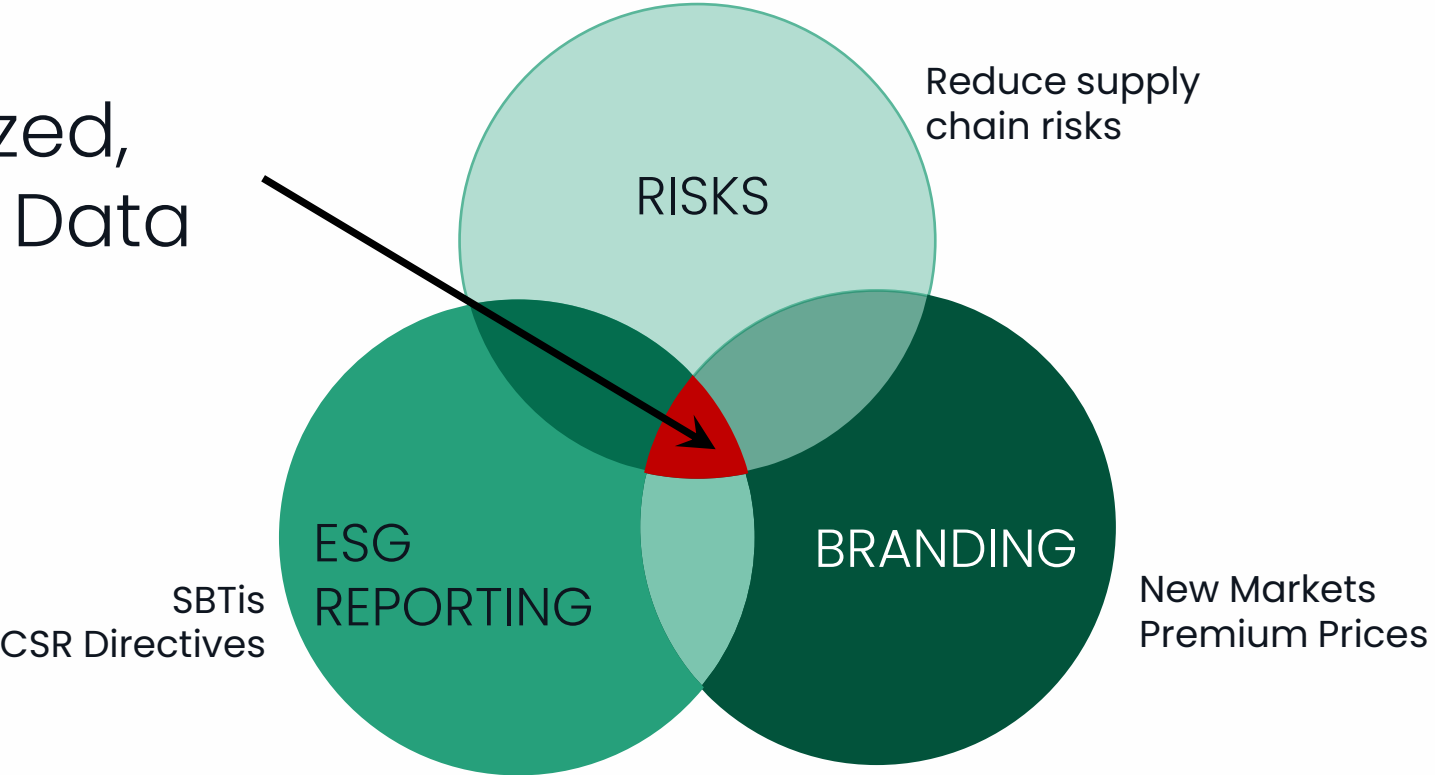
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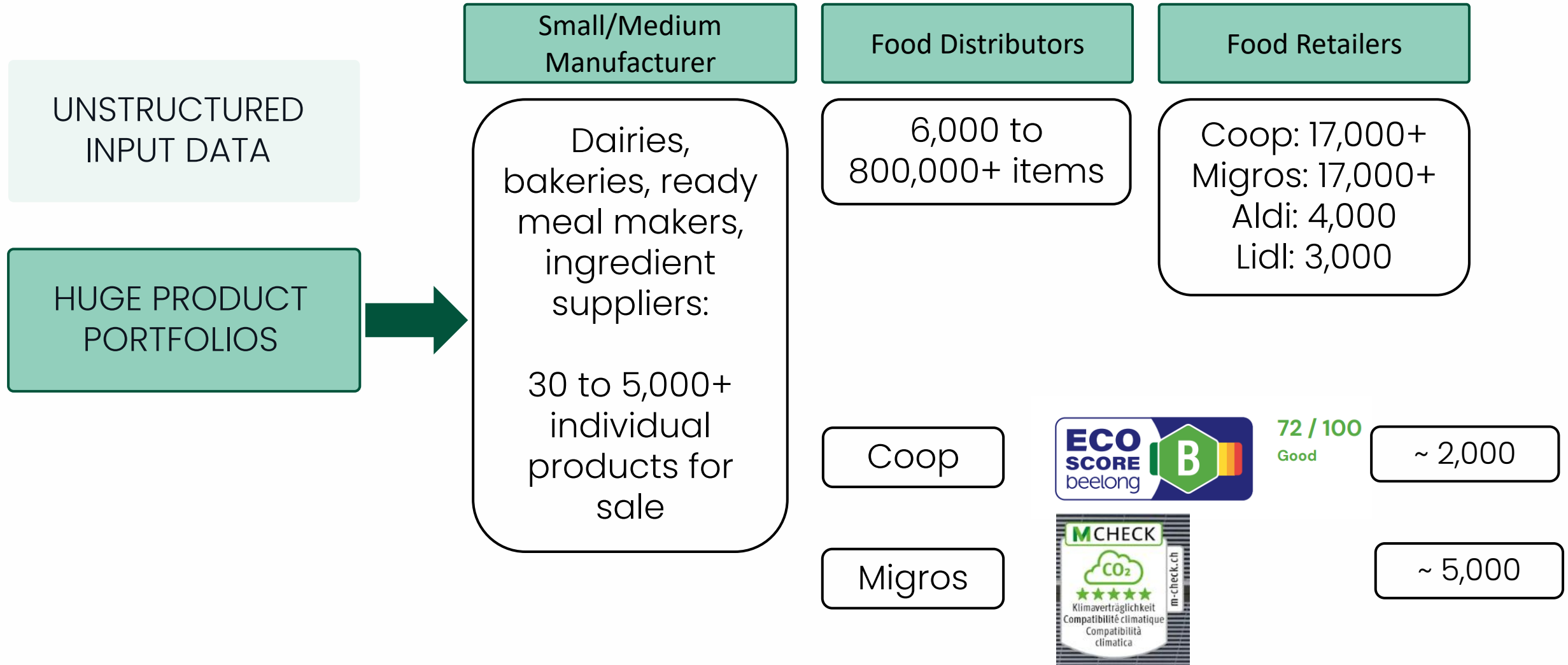
NIATSU

KEY FOOD INDUSTRY ACTIVITIES NOW INCLUDE CARBON METRICS

Organized,
Scalable Data



WHY IS THIS DIFFICULT?



WHY IS THIS DIFFICULT?

UNSTRUCTURED
INPUT DATA



HUGE PRODUCT
PORTFOLIOS



Rohkaffee	Herkunft	Region	Produzent/Ort	Anbauhöhe m ü. M.	Varietät	Aufbereitung	Röstprofil	Anteil	
Honduras SHG EP	Honduras	Copan / Lempira	Alianza de Mujeres	1'000 - 1'250	Arabica Catuai	washed	Mittel	40 %	
Peru SHB Grade 1	Peru	Junin	Cooperativa Villa Ecologica	1'200 - 1'350	Arabica Caturra	washed	Mittel	40 %	
India Parchment AA	Indien	Bezirk Chickmagalur	Karnataka	750 - 1'000	Robusta	natural	Mittel	20 %	
Zertifizierung	ID-Nr.	URL Verweis						Total	100 %
Bio & Fairtrade	28088	https://www.maxhavelaar.ch/produzenten/liste/die-kaffee-kooperative-villa-ecologica-in-peru.html							
Bio & Fairtrade	19371	https://www.maxhavelaar.ch/produzenten/liste/die-kleinbauernorganisatioin-anei-in-kolumbien.html							

UNSTRUCTURED INPUT DATA

AI PROMPT ENGINEERING

The science of designing, refining, and optimizing input prompts to guide generative AI models to produce accurate, relevant, and high-quality outputs.



A structured list of organized, relevant data

Step 1: STRUCTURE INPUT DATA

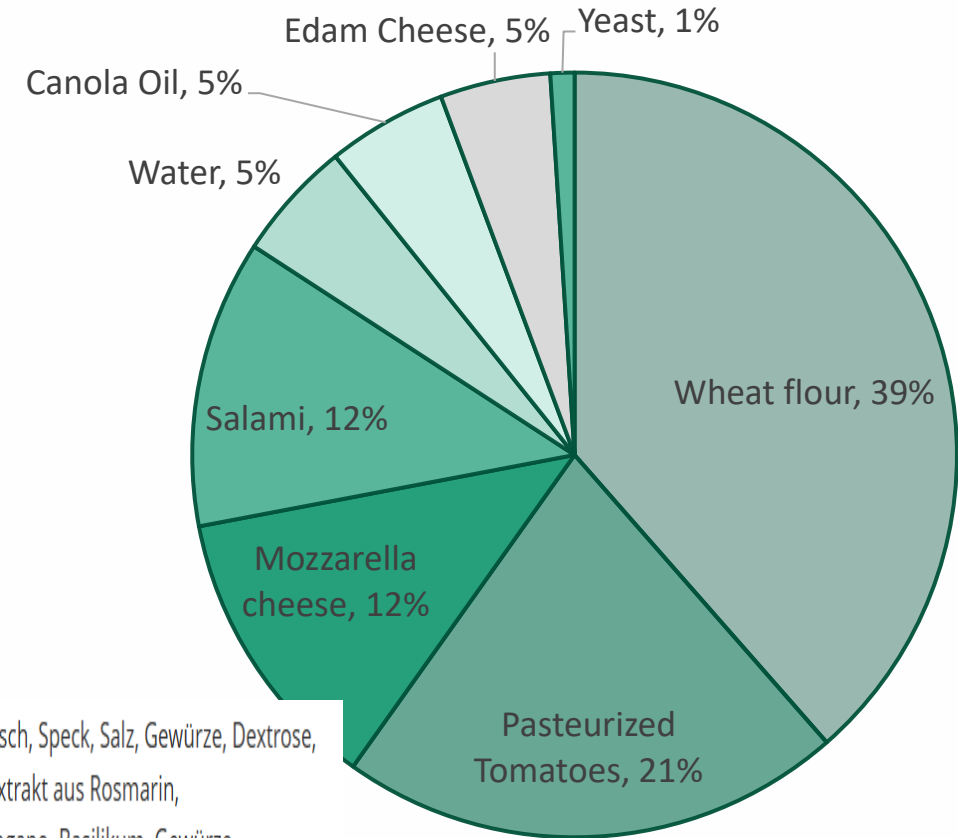


Ingredients

WEIZENMEHL, 21% Tomatenpüree, 12% schnittfester **MOZZARELLA KÄSE**, 12% Salami (Schweinefleisch, Speck, Salz, Gewürze, Dextrose, Zwiebelpulver, Knoblauchpulver, Gewürzextrakte, Stabilisator (Natriumnitrit), Antioxidationsmittel (Extrakt aus Rosmarin, Natriumascorbat), Rauch), Wasser, Rapsöl, 4,6% **EDAMER KÄSE**, Backhefe, Salz, Zucker, Dextrose, Oregano, Basilikum, Gewürze, Petersilie. Kann enthalten: **SOJA, SENF**.

Information for allergy sufferers: See highlighted ingredients

Dr. Oetker Frozen Salami Pizza



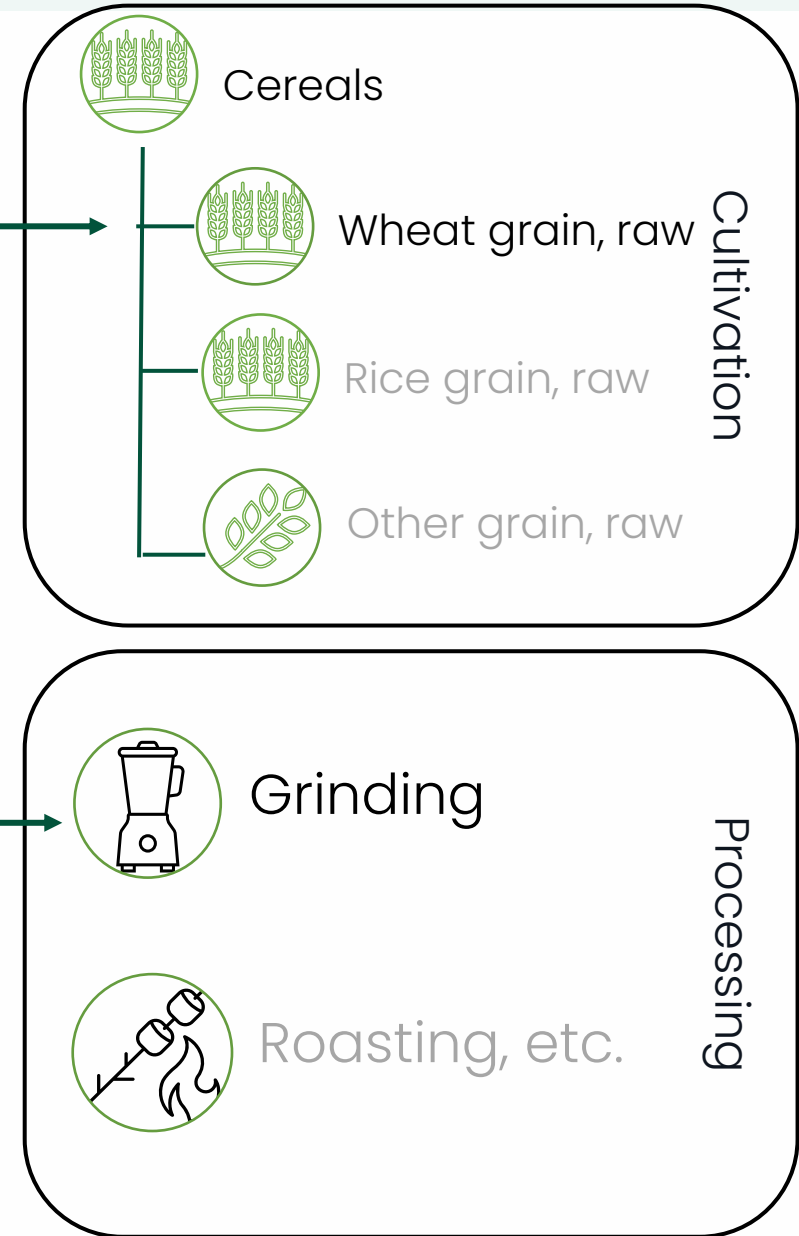
Step 2: Categorize Ingredients

INGREDIENT
Wheat flour (CH)
Pasteurized tomatoes (IT)
Mozzarella cheese
Salami
Canola Oil

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Niatsu's neural network matching engine

* Confidence Ranking for Human Intervention



Step 3: Link to Impacts

NIATSU'S IMPACT DATABASES



Wheat,
raw (CH)

+



Grinding
(CH)

+



Other
Ingredients

Wheat, raw, DE

Wheat, raw, IN

Wheat, raw, CH
(kgCO₂eq/
kg raw wheat)

Grinding, DE

Grinding, IN

Grinding, CH
(kgCO₂eq/
kWh Swiss electricity mix)

Complete
Product
LCA

Case Study – Swiss Retailer

UNSTRUCTURED
INPUT DATA

HUGE PRODUCT
PORTFOLIOS

NIATSU



STRUCTURED, CATEGORIZED
DATA LINKED TO IMPACTS

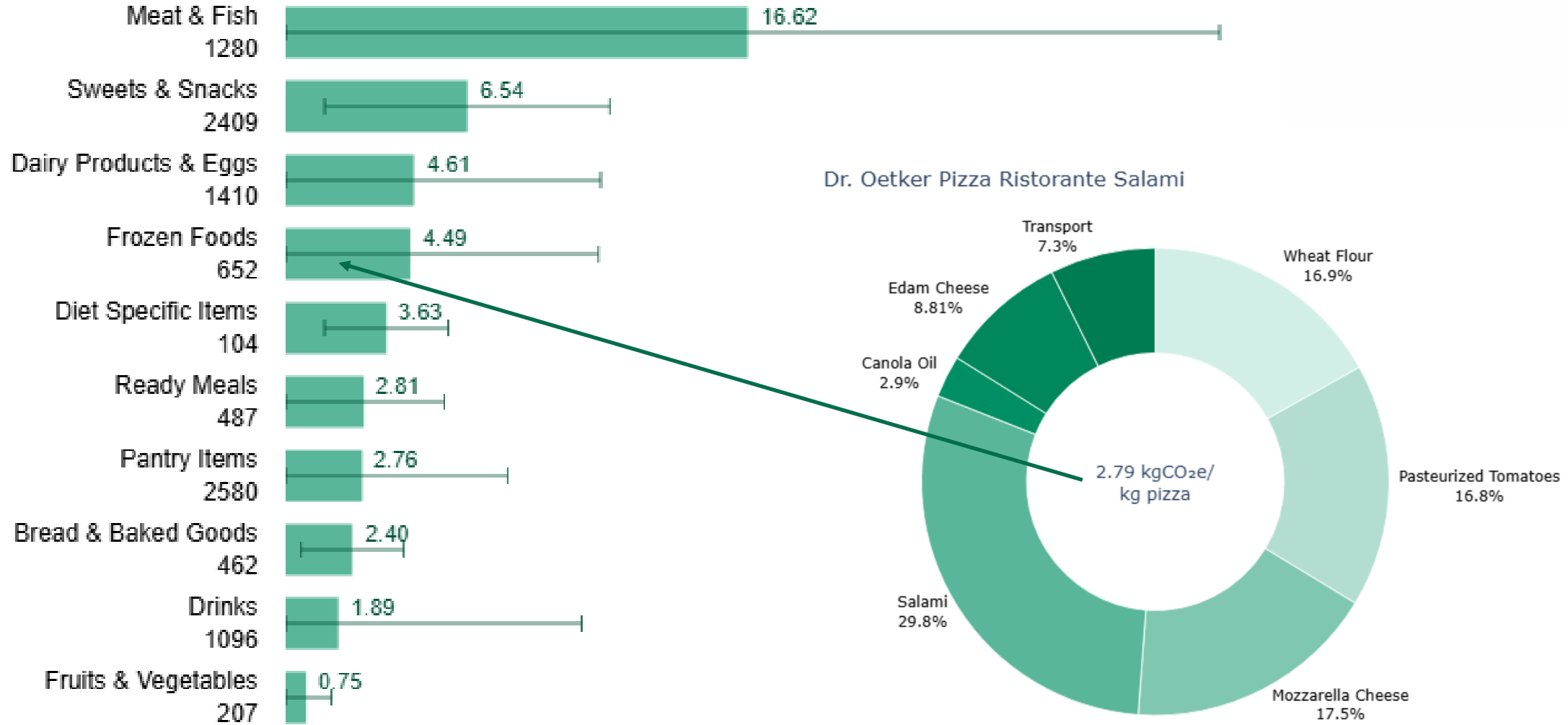
Automated processing (17,000 items):

- 2 days from unstructured online retailer data to product LCAs

Manual work:

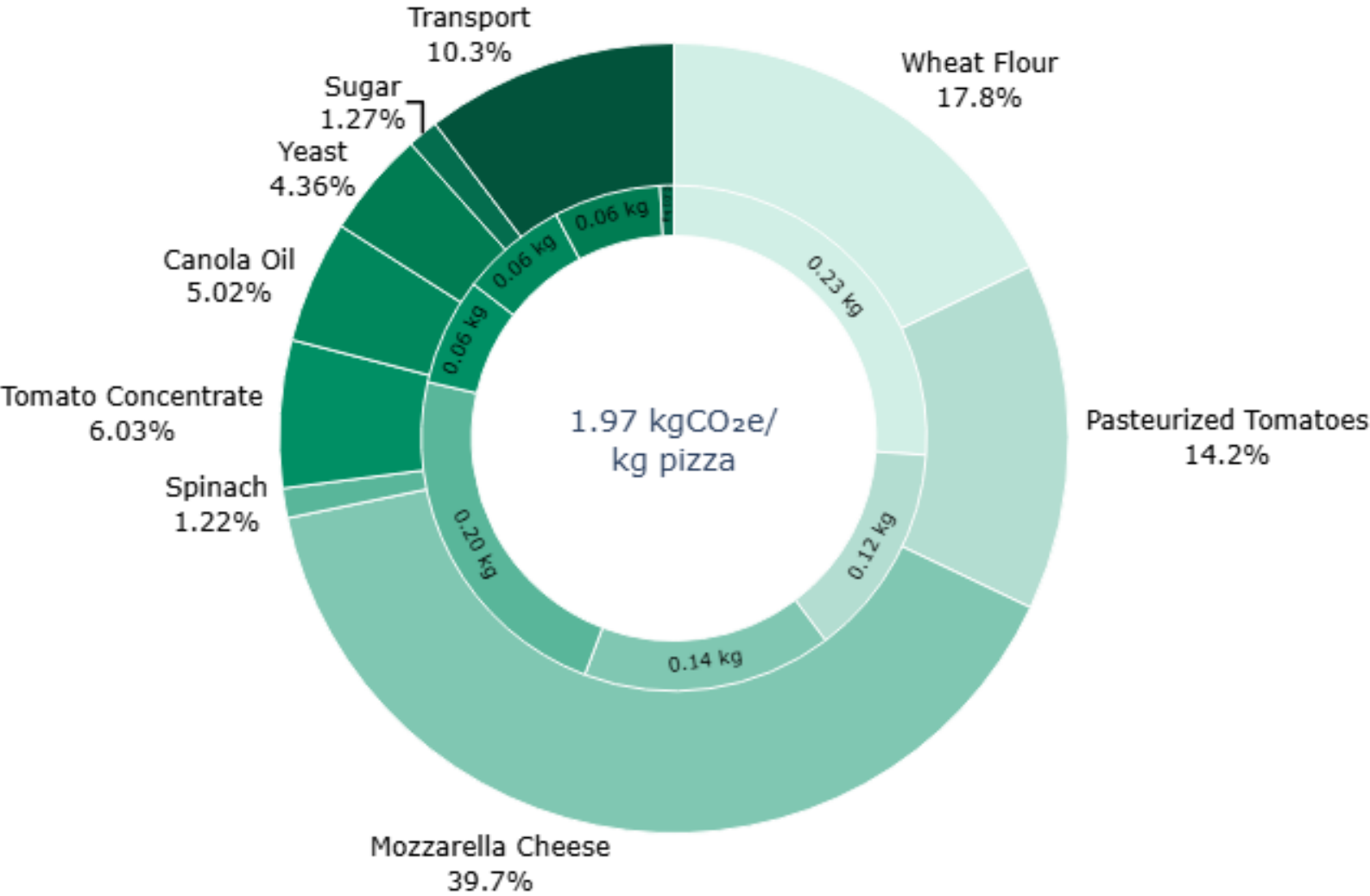
- 1 day to perform quality control on flagged items

Case Study – Results



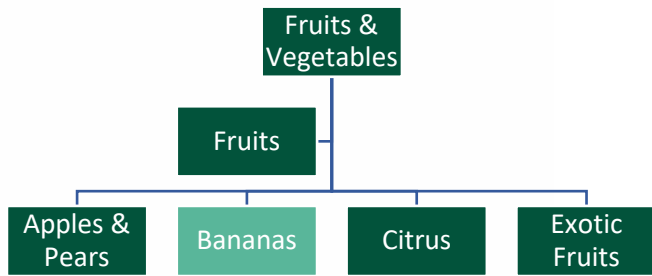
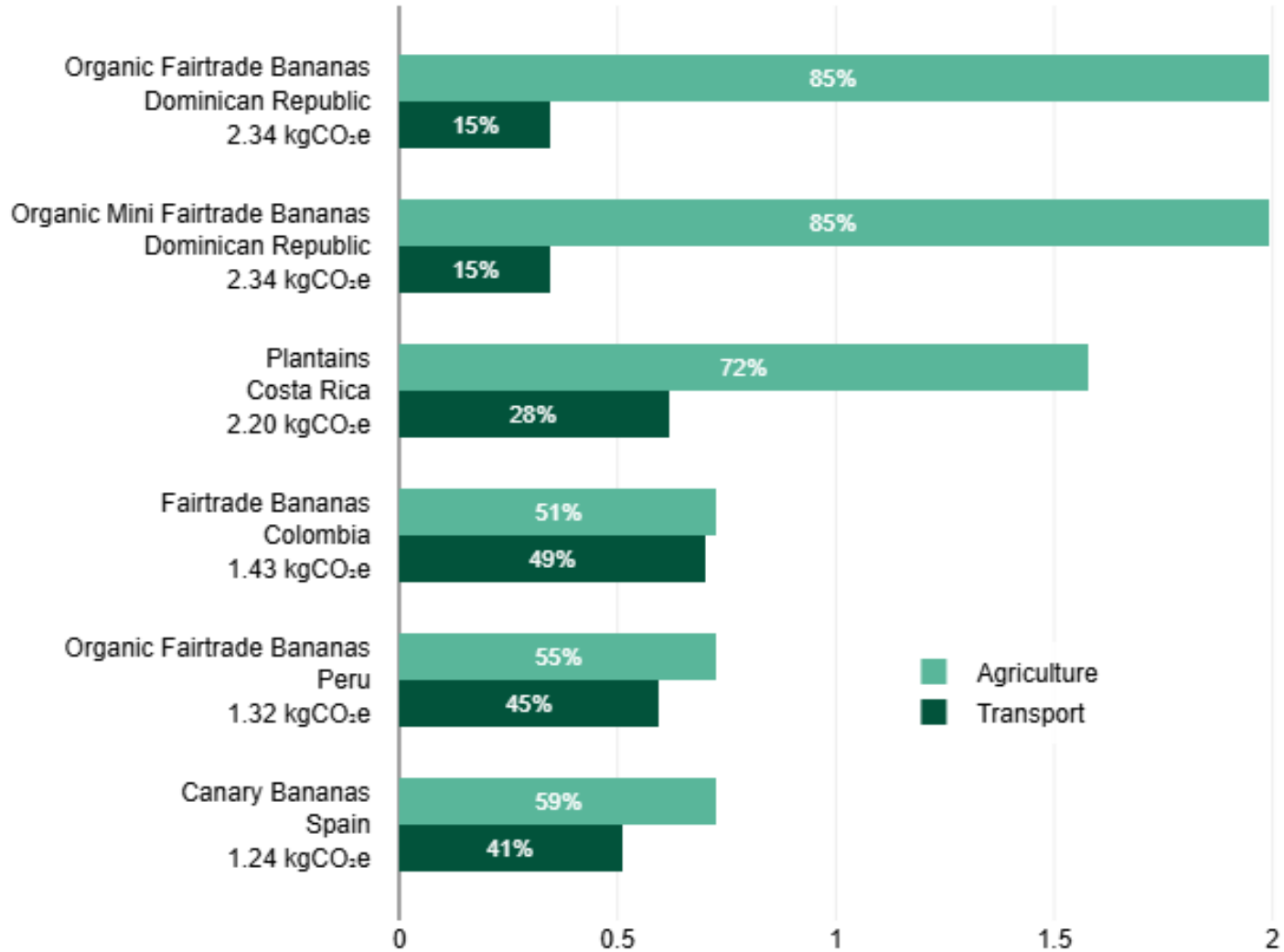
Case Study – Results

Dr. Oetker Pizza Ristorante Spinaci



Case Study – Results

Impacts per available banana types (kgCO₂e per kg of bananas)



- Level of human oversight for so many LCAs is not possible
 - AI data quality rating for the model itself
- Sometimes even prompt engineering struggles with an answer
 - Ingredient Mismatch: Baking Mix \neq Baking Soda
- Accuracy is still limited by available published impacts
 - LCA data quality rating

- Detailed, fast LCAs for 8,000+ products per day – automated
- Identical methodology and system boundaries for all products
- Possibility for human checks
 - system ‘learns’ with the more products it models
- Easy to expand system:
 - product modeling is automated – impact database can easily be interchanged