**The problem**
Supermarkets reduce prices on food near expiration. Most customers don't know about them or how to apply them though, and this results in food waste and environmental degradation. While it is difficult for supermarkets to encourage customers towards such bargains in an attractive and customized way.

**Our Solution**
We have built a smart recommendation engine based on real-time data accessed via Salling Group's food waste API. The engine supports users in finding discounted products based on what they can save money on, what they wish to have, or what products they keep in stock. We used machine learning and rule-based filtering to suggest the most appropriate products and even generate recipe suggestions on large language models (LLMs).

**Findings and Recommendations:**
Our findings indicated that although discounted product information is rich in data, it is also inconsistently named, making it hard to filter. Simple rule-driven models that relied on savings and discount margins consistently identified the best offers. Discoverability was greatly improved by allowing users to search by keywords (such "milk" or "bread"), even in cases where product names are inconsistent. By enabling users to ask for suggestions for recipes in casual language, a Large Language Model was added, increasing its effectiveness and making it more adaptable and enjoyable to use. We propose a hybrid recommendation strategy based on these findings that combines store-promotion deal finding, keyword-based filtering, and AI-powered recipe recommendations. This would improve the consumer experience, encourage the use of products that are on sale, and directly reduce food waste.

**Highlights:**
• Developed a hybrid recommendation engine based on rule-based logic, word search-based strategy, and generative artificial intelligence.
• Real-time insights are obtained by connecting the Salling Group store's live discount data.
• Developed an adaptive GPT-4 assistant to tailor meal recommendations according to dietary requirements and personal preferences.
• Developed a scalable, user-centered solution to promote sustainable buying.
• Showed evident potential to integrate into retail channels and platforms for consumers.

**Limitations**
• The absence of real user interaction data limited our ability to test in real-world scenarios.
• Categorization discrepancies posed challenges to traditional filtering approaches.
• Certain product categories, notably pre-prepared meals, were difficult to place in effective recommendations.
• The model occasionally generated unrealistic or out-of-vocabulary item pairs.
• It was evaluated through internal testing and simulation rather than live deployment.