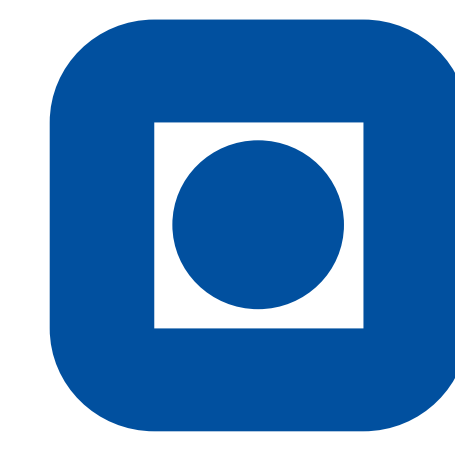


TEMPORALITY IN ONLINE FOOD RECIPE CONSUMPTION AND PRODUCTION



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GOAL

Understanding the hidden temporal dynamics in online food communities to come up with new models and to improve current recommender mechanisms.

DATA SET

Our study relies on a dataset obtained from the German online food community website kochbar.de; one of the largest of its kind in Europe.

Kochbar-Torte

66 Rezeptbewertungen
Rezept der Woche, 9. Juni 2014
1000. Bärchenrezept in Zusammenarbeit mit meiner Schwester. Als Dankeschön an alle meine lieben Kochbarfans

ZUTATEN

Für den Schokoladenbiskuit

- 120 Gramm Block Schokolade oder Kuvertüre
- 7 Eier getrennt
- 200 Gramm Zucker
- 150 Gramm Mehl
- 50 Gramm Speisestärke
- 60 Gramm Butter
- Fett und Mehl für die Form

Erdbeer-Vanille Buttercreme

- 600 Gramm Erdbeeren
- 300 Gramm Butter weich
- 100 Gramm Zucker
- 1 Päckchen Vanille-Pudding Pulver

Marzipandecke

- 300 Gramm Marzipanrohmasse
- 250 Gramm Puderzucker
- Puderzucker zum ausrollen

REZEPTINFOS

Schwierigkeitsgrad leicht
Zubereitungszeit keine Angabe
Preiskategorie € € €

Angaben pro 100 g

- kJ (kcal) 1402 (335)
- Eiweiß 1,3 g
- Kohlenhydrate 43,2 g
- Fett 17,7 g

WEBSITE PREVIEW

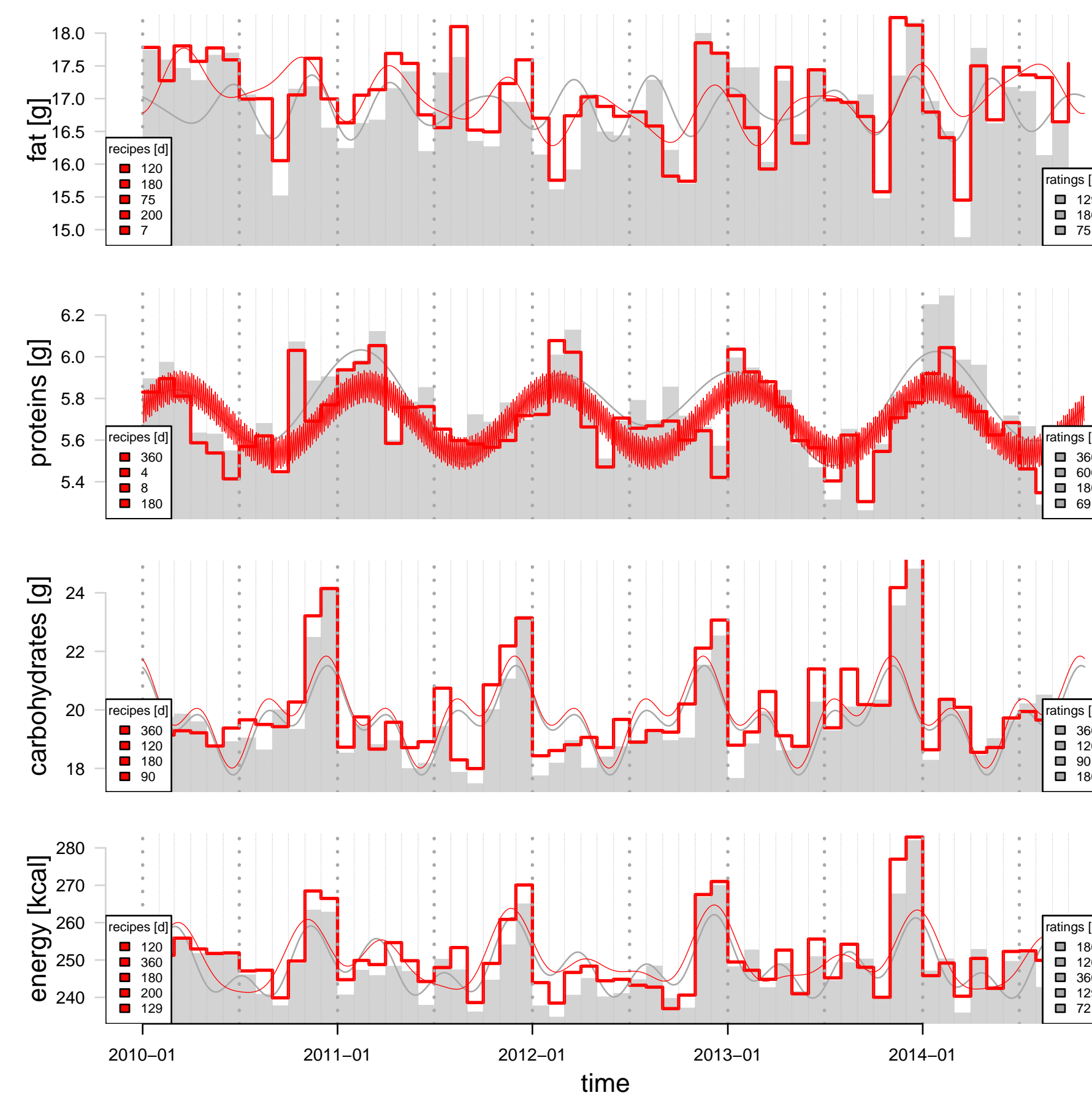
Website Preview

Dataset Statistics: 400 thousands recipes from years 2010-2014 labeled with 230 categories of 4 classes, 200 thousands users providing 7 million ratings.

METHOD

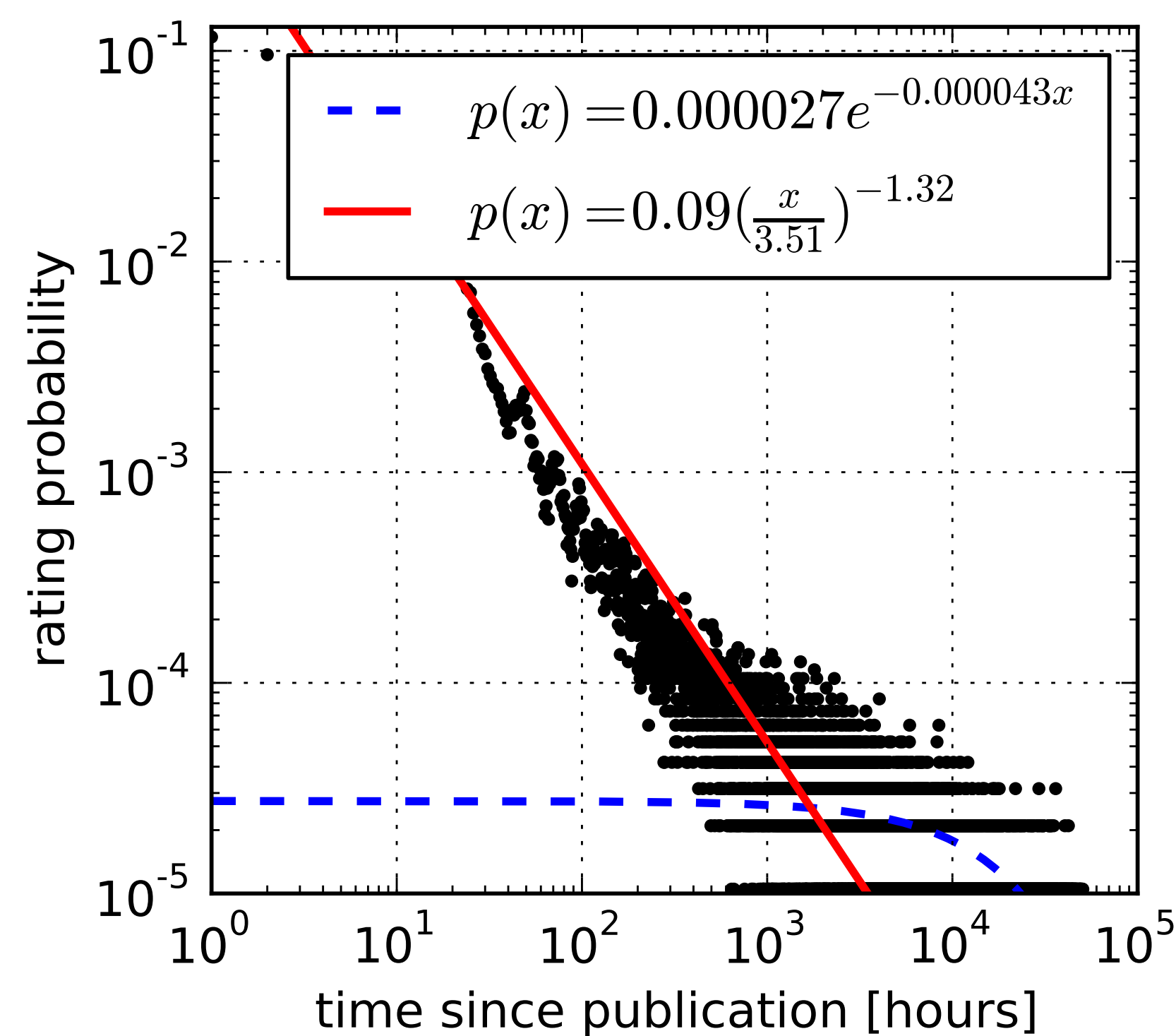
- We compared food production and consumption temporal characteristics in terms of the average values of nutrients.
- Using *Spectral Density Estimation* we analyzed the most important periods.
- We modeled recipes interest decay with a *power law* function.
- We introduced **recipe lifetime** (the time for which the fitted cumulative distribution function of interest is equal to 0.9).
- We quantitatively analyzed lifetime of recipes from various food categories.

RESULTS



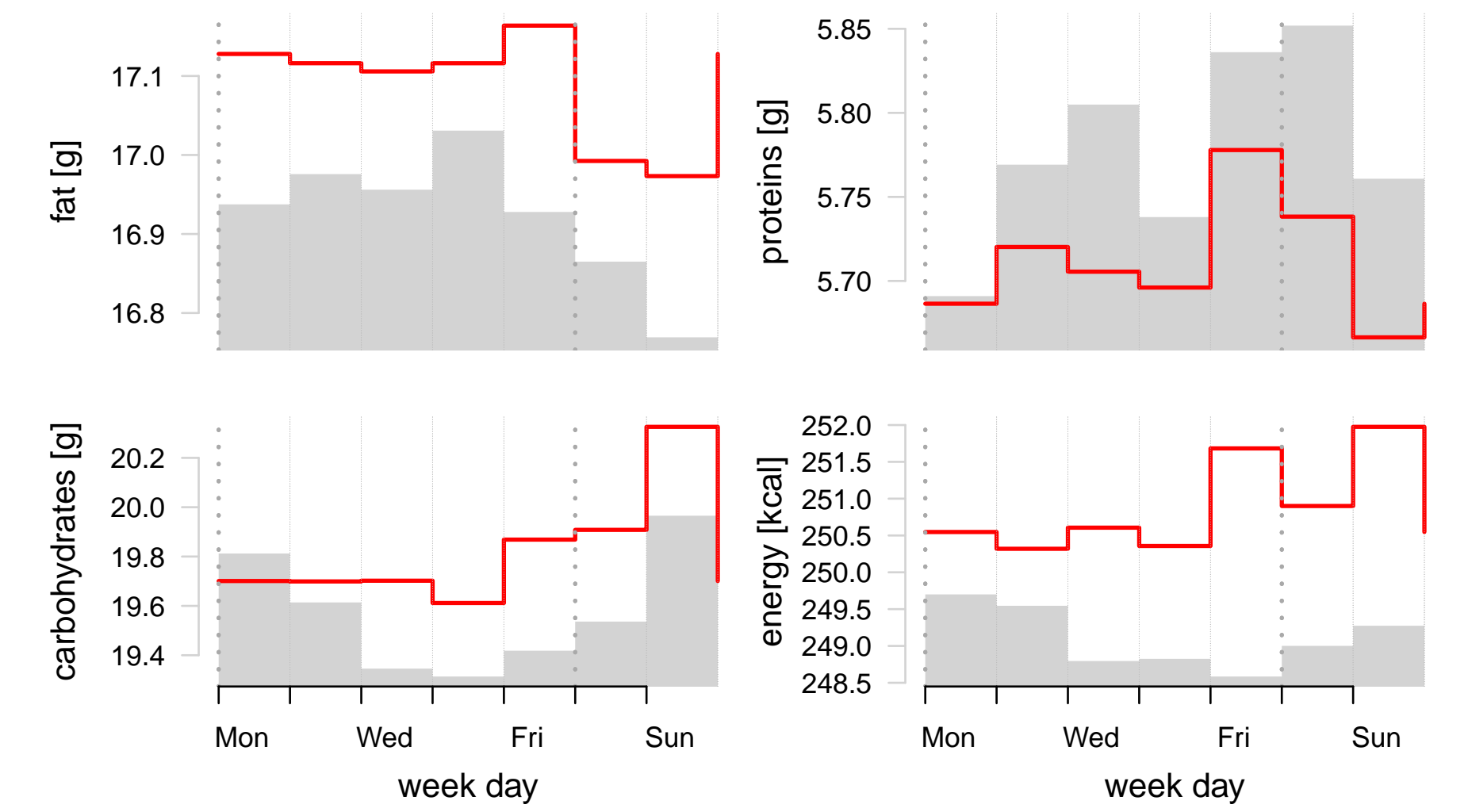
Seasonal trends in online food recipe production (contour line) and consumption (bars).

Users' interests for newly published recipes follow a power law function. We also observe different temporal preference patterns and lifetimes in various recipe categories.



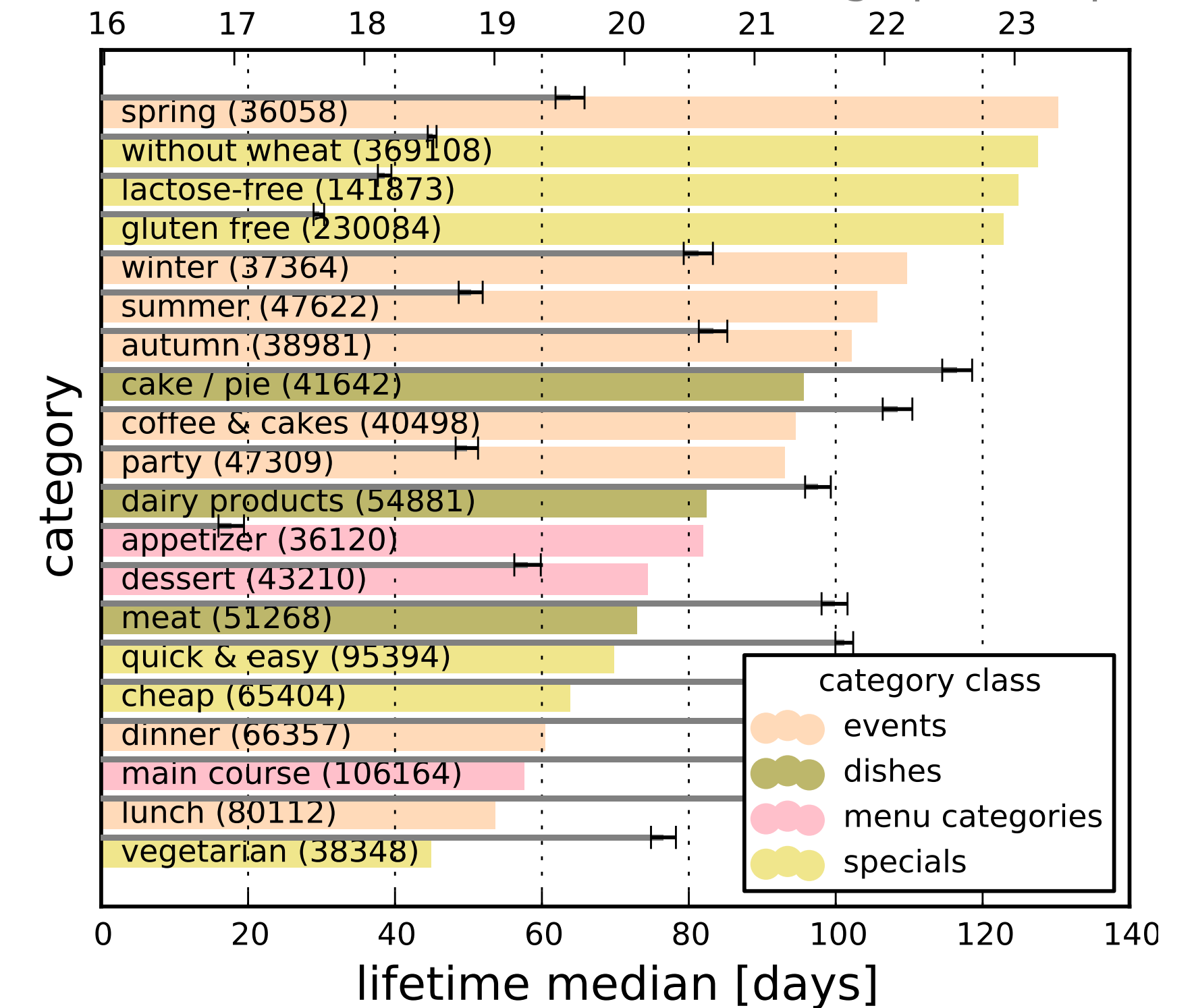
Fitting exponential (dashed line) and power law (continuous line) models to recipes interest (measured with number of ratings) decay.

There are a range of hidden temporal patterns in terms of food preferences and in particular in consumption and production.



Weekly trends in online food recipe production (contour lines) and consumption (bars).

(mean +/- stderr) number of ratings per recipe



Lifetime (colored bars) and number of ratings per recipe (gray bars) in 20 the most popular categories (number of recipes assigned provided in brackets).

FINDINGS

- Seasonal and weekly trends and patterns of nutrients are found (for carbohydrates and calories bursts are observed in November and December, for proteins bursts are more flat and shifted towards late winter and early spring; for carbohydrates and calories seasonal ones are more prominent).
- There is a **gap between what is produced and consumed** in terms of nutrients (we observe the preference towards low-fat, low-carbohydrates but high-protein recipes).
- Users' interests for newly published recipes follow a **power law** function.
- There are different temporal preference patterns in recipe categories (e.g., spring or gluten-free recipes are more persistent in time than recipes for vegetarians).
- Statistically significant **negative correlation between categories lifetimes and ratings** is observed (more persistent categories earn less attention than these more innovative).

REFERENCES

- [1] C. Wagner, P. Singer, and M. Strohmaier. The nature and evolution of online food preferences. *EPJ Data Science*, 3(1):1–22, 2014.
- [2] R. West, R. W. White, and E. Horvitz. From cookies to cooks: Insights on dietary patterns via analysis of web usage logs. In *Proc. of WWW'13*, pages 1399–1410, 2013.