



Price prediction tool for farms' risk management and policy-making purposes

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1. Introduction

- Agricultural holdings exposed to many risks
- In agriculture many risks hardly insurable – e.g. weather changes, price volatility
- Aim of the contribution:
 - introduce mathematical tool that predicts the development of the prices of commodities in short term horizon
 - help the farmers to mitigate the risks of prices volatility or take these changes into account in their decision-making processes



2. Other models for price prediction

- OECD annual outlooks
 - Longer term price development predictions
 - On the world level
 - Explanatory variables: macroeconomic and trade variables
- European Commission
 - Price predictions for EU
- Drawback of both types:
 - Done on a broader regional level
 - Difficult to use by individual farmers
 - Important national conditions affecting the prices of agricultural commodities not taken into account
- => our model (named CEN) created for one country, Czech Republic; takes into account as explanatory variable only time (previous development of prices)

3. Model CEN 2 for price prediction

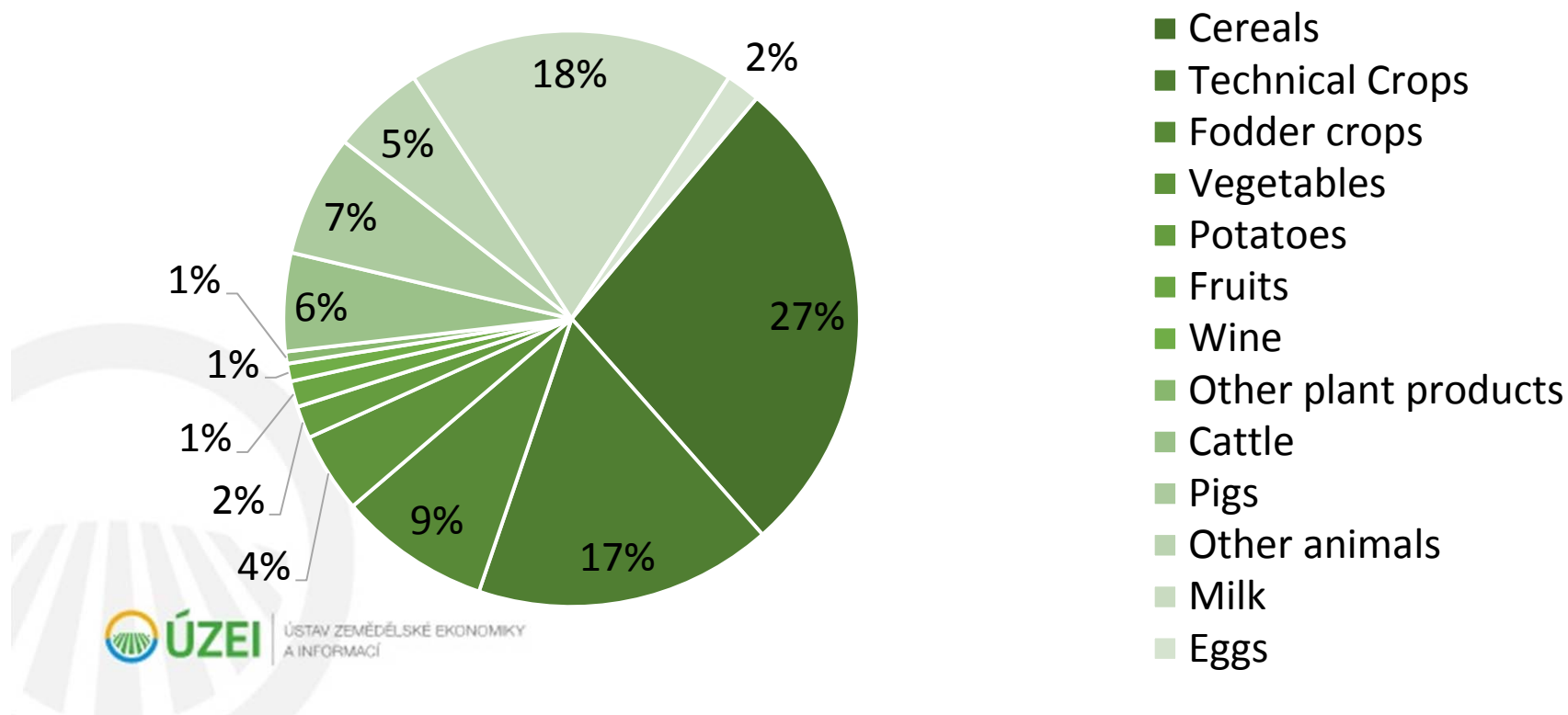
- CEN 2 model is part of the modeling tool, which predicts of Czech Economic Accounts of Agriculture
- 37 Basic commodities
 - Commodities with the largest representation in production in the Czech Republic
- Baseline since year 2000
- Commodity prices are gathered monthly
 - Model is able to fill-in the gaps if the price in particular month is not available
- Model is based on seasonal trend forecast method
 - Moving projection – shifting base by one step (year) forward

Options of CEN 2 model

- Forecast types – Linear regression / Power regression
- Seasonality – 1 Year / 12 Month
- Current prices / Constant prices for 2000
- Prediction 01/2016-12/2017

Selecion of commodities

- Selection of commodities for modelling according to the comodity structure in Czech Republic in 2015
- Total agricultural production 121 MLD CZK

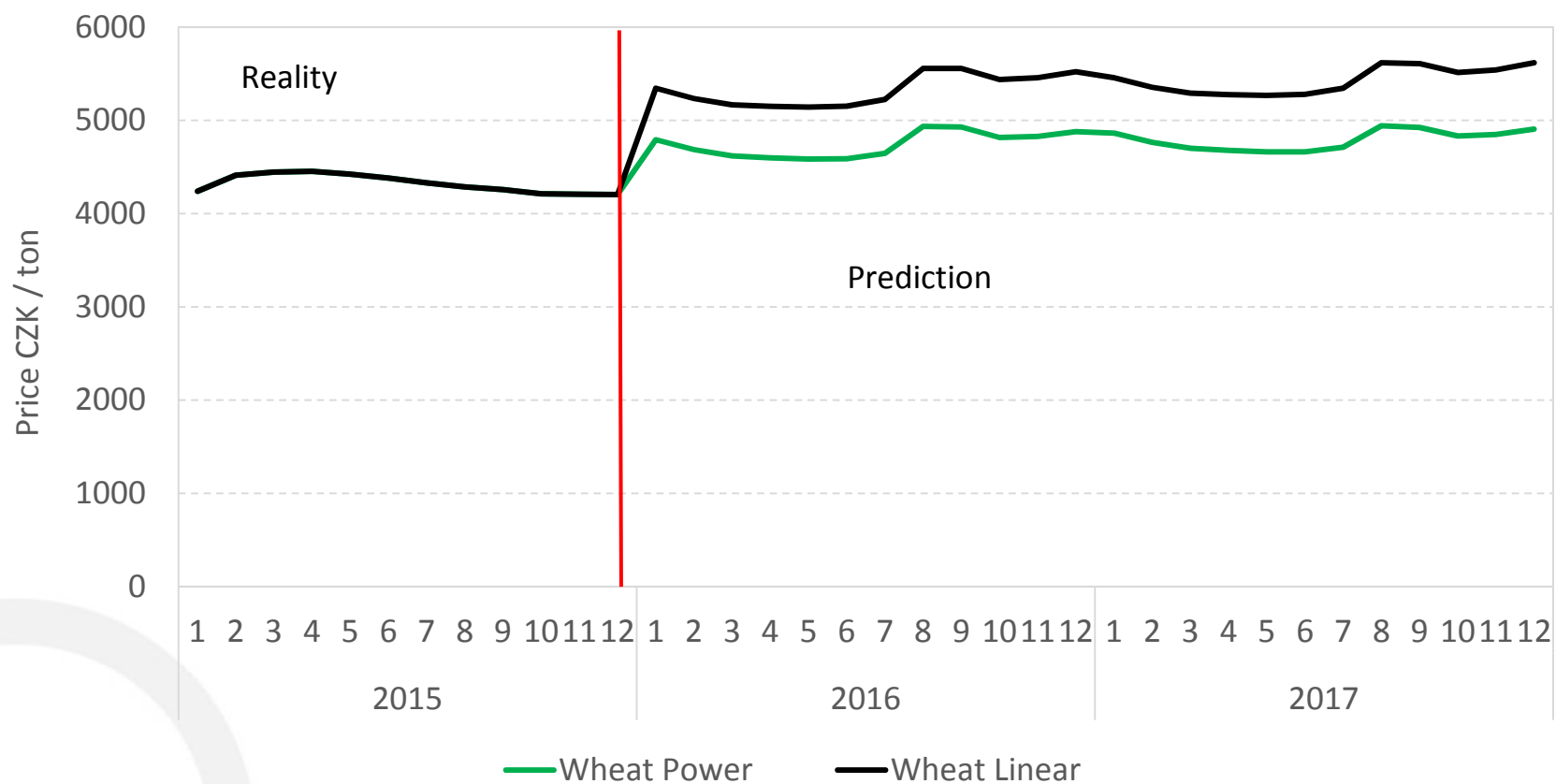


Predictions in current prices

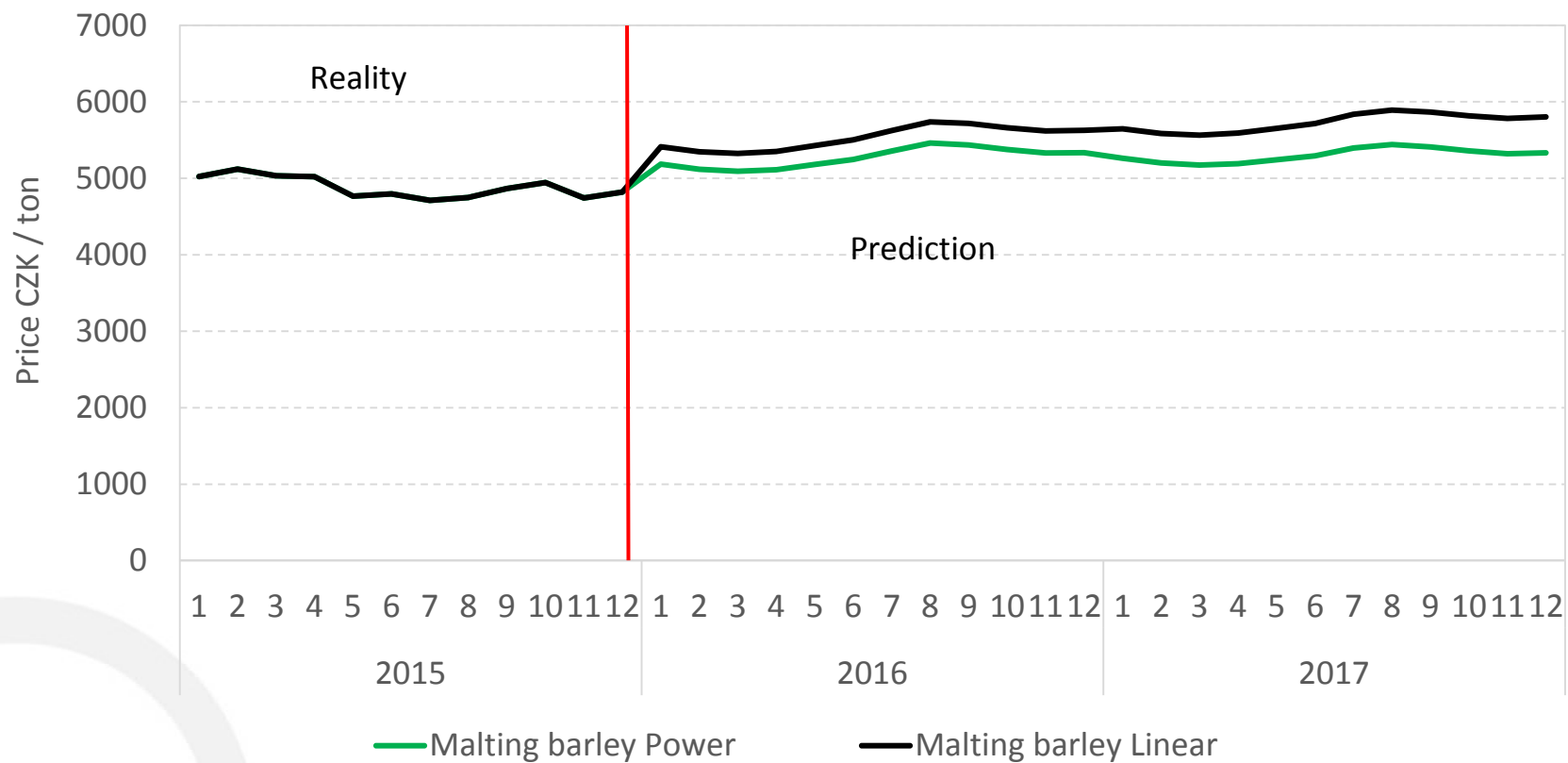
Prediction horizon 01/2016 – 12/2017



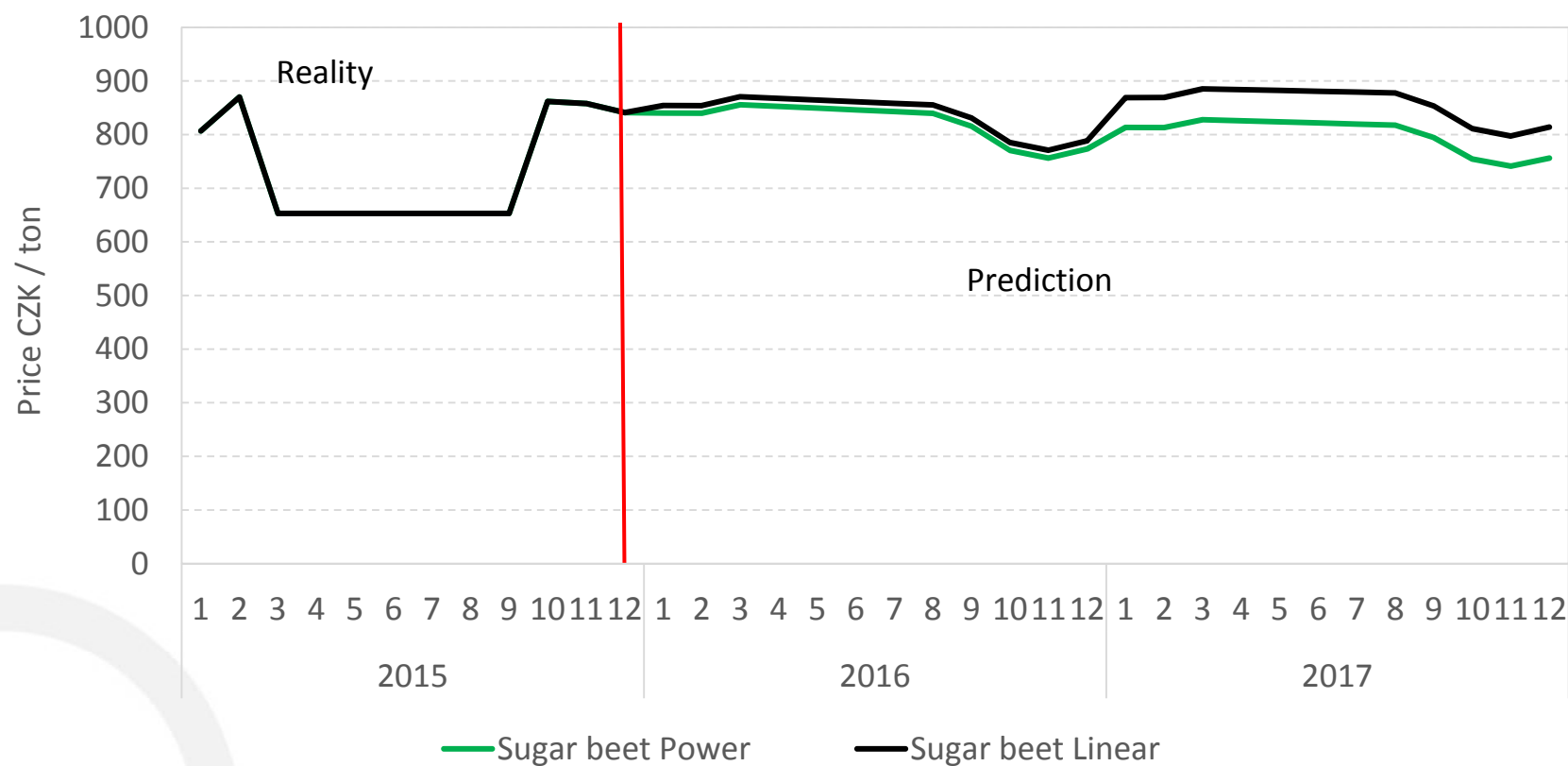
Wheat prediction (2015-2017)



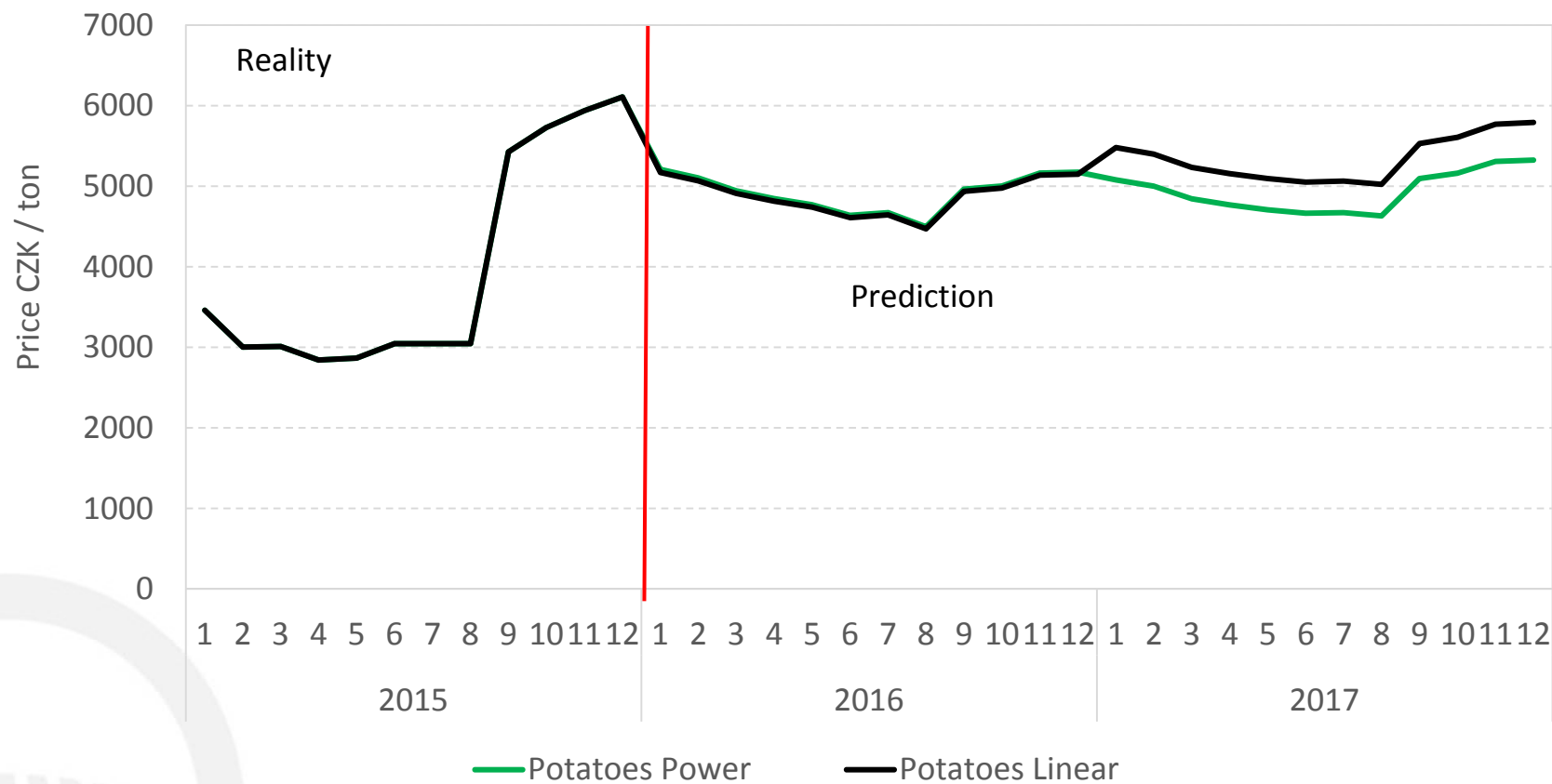
Malting barley prediction (2015-2017)



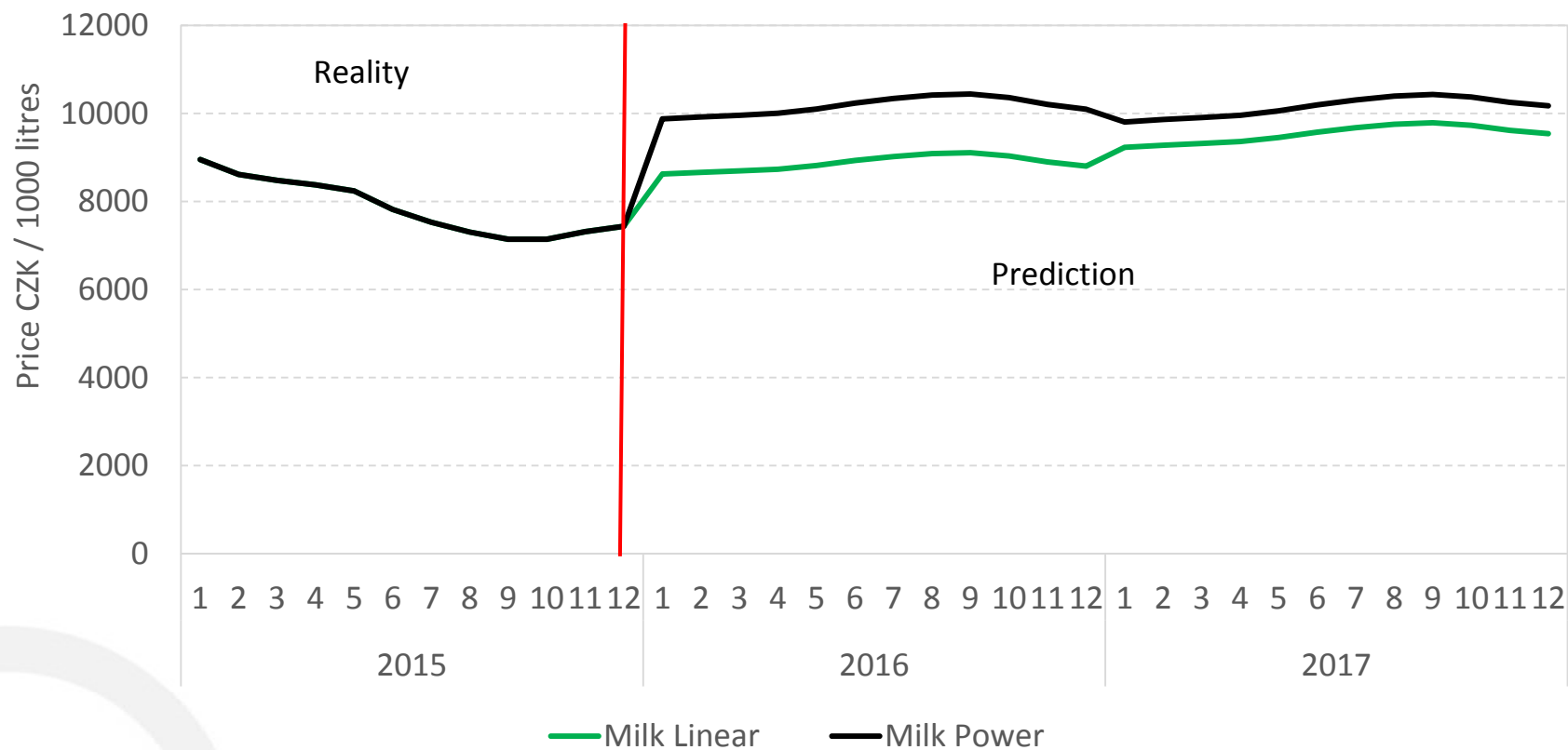
Sugar beet prediction (2015-2017)



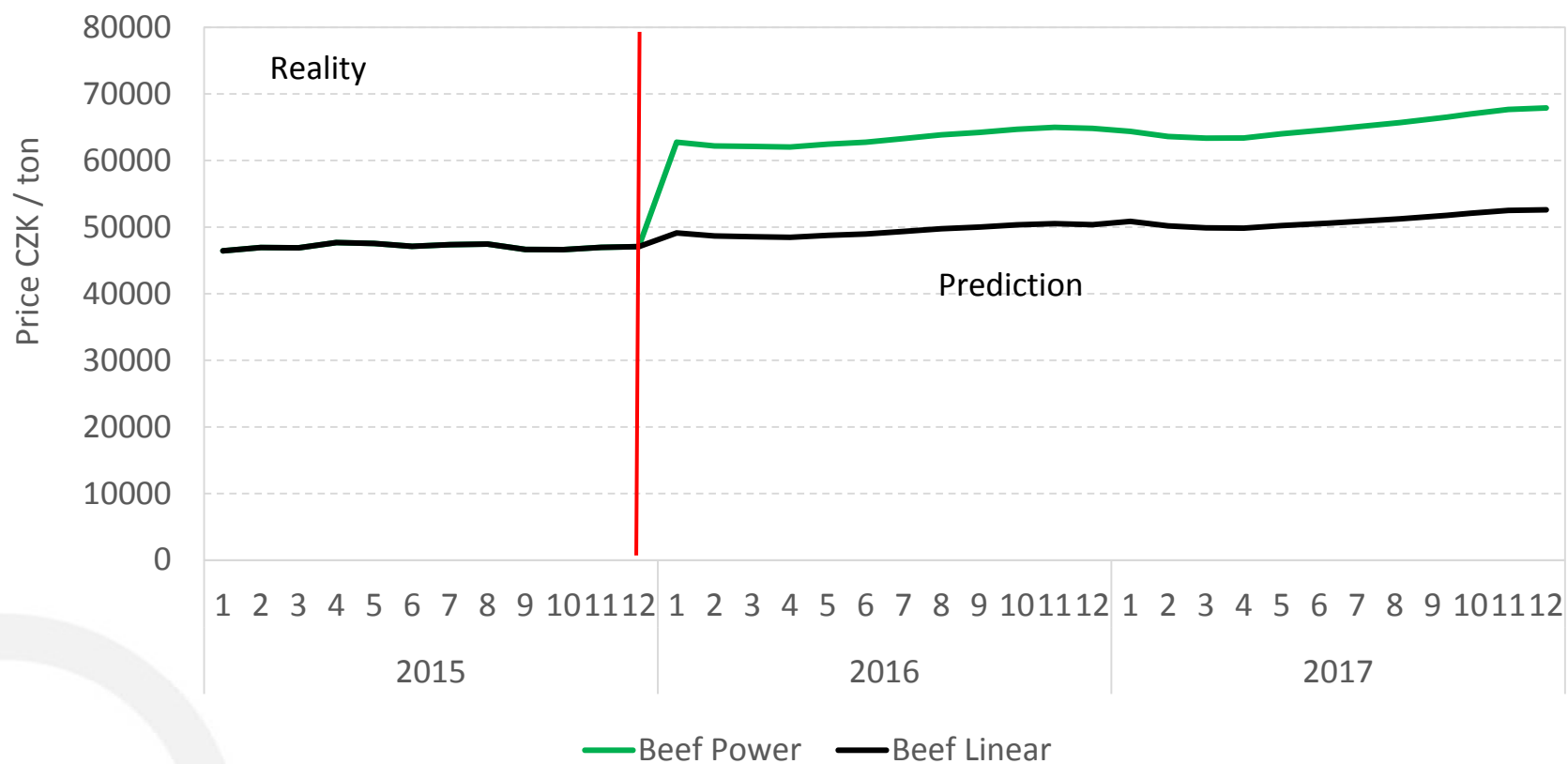
Potatoes prediction (2015-2017)



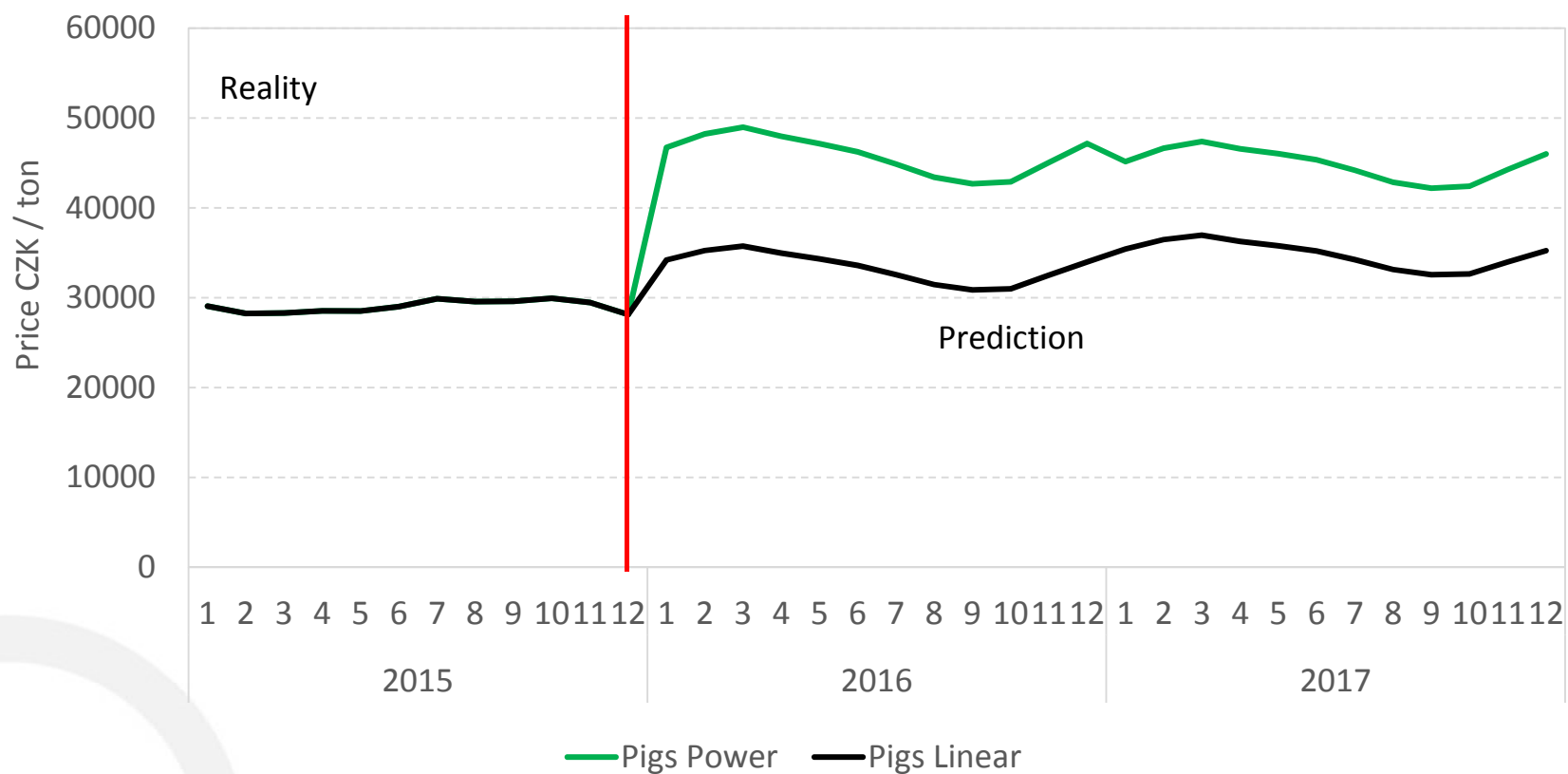
Milk prediction (2015-2017)



Beef prediction (2015-2017)



Pigs prediction (2015-2017)

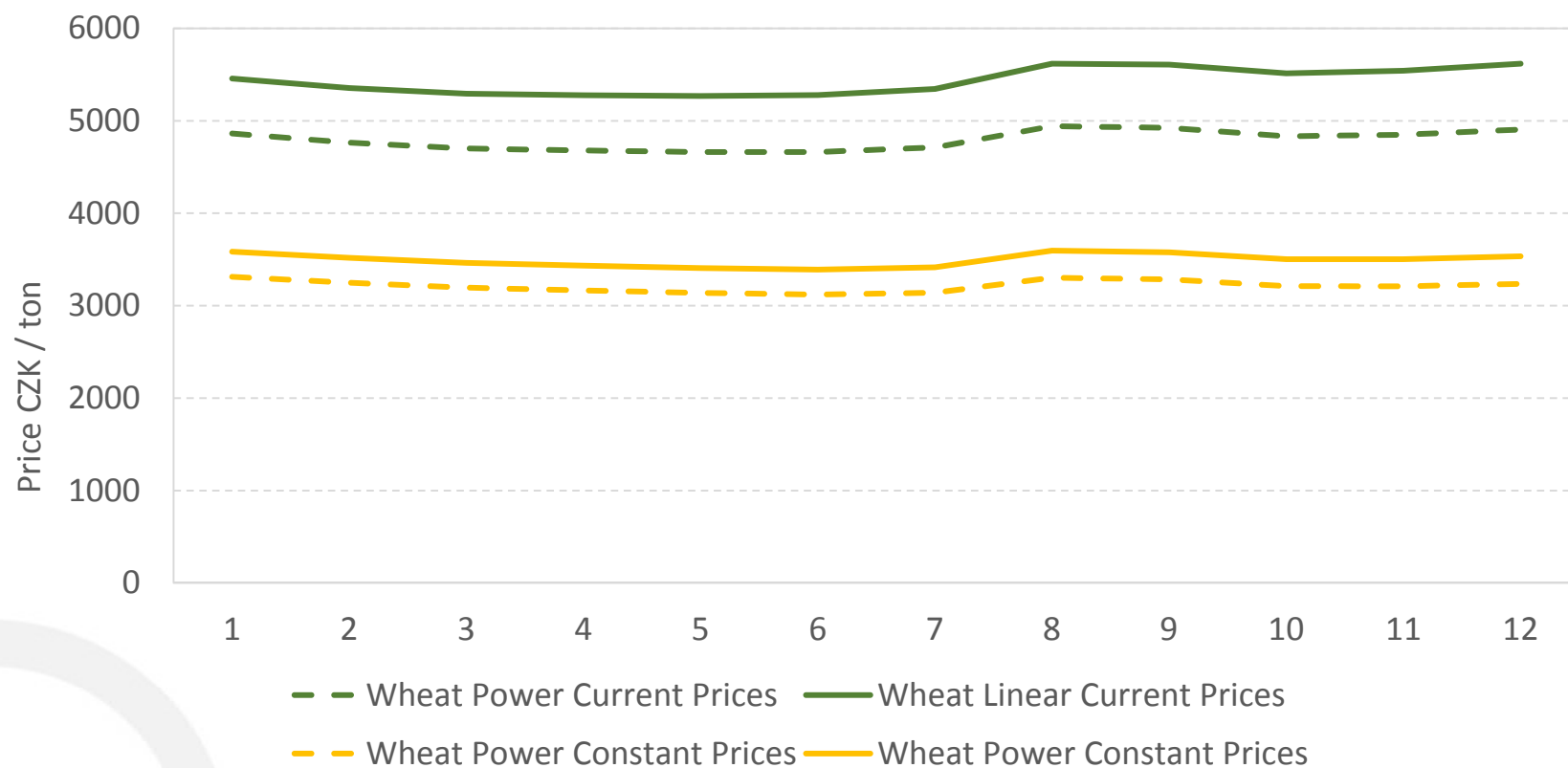


Comparison of predictions in current and constant prices

Prediction for 01 – 12/2017



Wheat prediction comparison (2017)



4. Conclusion

- Aim of the contribution was to introduce mathematical tool that predicts the development of the prices of commodities in short term horizon
- The results can be used:
 - by individual farmers – for planning of production
 - by policy-makers
 - predictions of the commodity prices linked to the “RDP model” (Chaloupka, Pechrová and Doucha, 2016 - *in press*) of cost-benefit analysis of investment projects under the Czech Rural Development Programme for years 2014–2020
 - CEN 2 is part of model prediction Economics Accounts for Agriculture



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