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PIGS FORAGING ON JERUSALEM ARTICHOKE - ANIMAL PERFORMANCE AND BEHAVIOUR

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FREE-RANGE GROWING PIGS IN DENMARK

- › Pigs on grassland
- › High stocking densities (100 m² per pig)
- › Difficult to maintain grass cover
- › Large inputs of concentrated feed (> 3 kg per kg growth)



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- > High risk of nutrient leaching
- > Additional pressure on land resources



NEED TO RETHINK THE FREE-RANGE SYSTEM

- › Integrate production of pork with other productions to increase the 'yield' per hectare [pigs integrated in energy crop production] Horsted et al. 2012. Livest Sci150: 200-208
- › Increase the nutrient uptake from foraging to lower the need for concentrated feed





-> Experiment with free-range pigs foraging on Jerusalem artichokes

JERUSALEM ARTICHOKE

- › High yields of tubers (8-10 tonne DM per hectare)
- › High content of inulin (boar taint, pig health)
- › Are the pigs willing to eat the tubers?!
- › Feeding value for pigs?



OBJECTIVES

- › To evaluate the nutritional contribution from foraging Jerusalem Artichokes (JA) in growing pigs
- › Investigate the effect of two different feeding strategies (*ad lib* vs. restricted) on performance, body condition and animal behaviour



HYPOTHESIS

- › Restricted feeding with concentrate (compared to *ad libitum*)
 - > will motivate the pigs to forage and therefore increase the uptake of JA
 - > will improve feed conversion ratio (of the concentrate)



EXPERIMENTAL SET-UP

- › December 2011 to January 2012 (40 d)
 - › 36 pigs of 60 kg allocated to six groups
 - › Allocated to one of two feeding regimes (**LIB vs. RES**)
 - › *Ad libitum* access to JA (18 %DM)
 - › 215 m² per pig
- I. LIB** *Ad libitum* access to an organic standard diet for growing pigs
- II. RES** Restricted access to an organic high-protein mixture: 0.9 kg ~ 8.9 MJ ME per d per pig

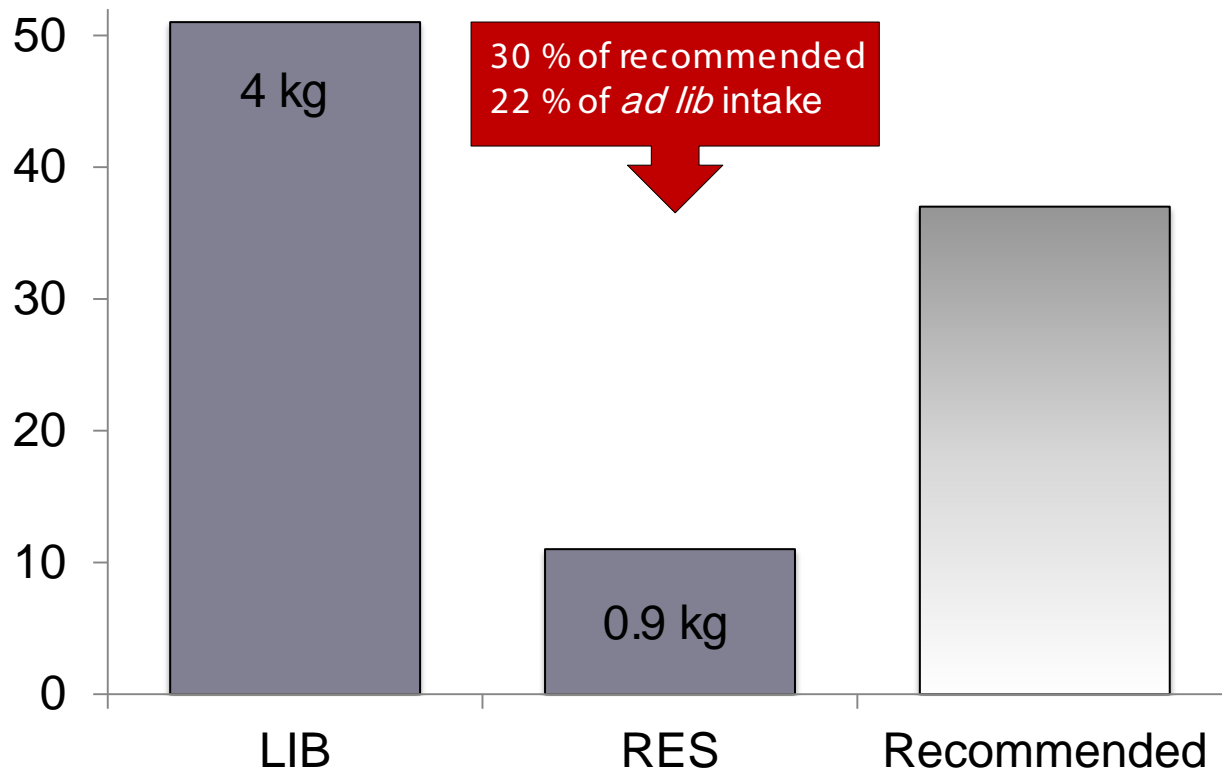


RECORDINGS AND OBSERVATIONS

- › Pigs weighed weekly
- › Feed intake recorded per group
- › Body condition scored at the beginning and at the end
- › Behavioral observations weekly (from dawn to dusk)

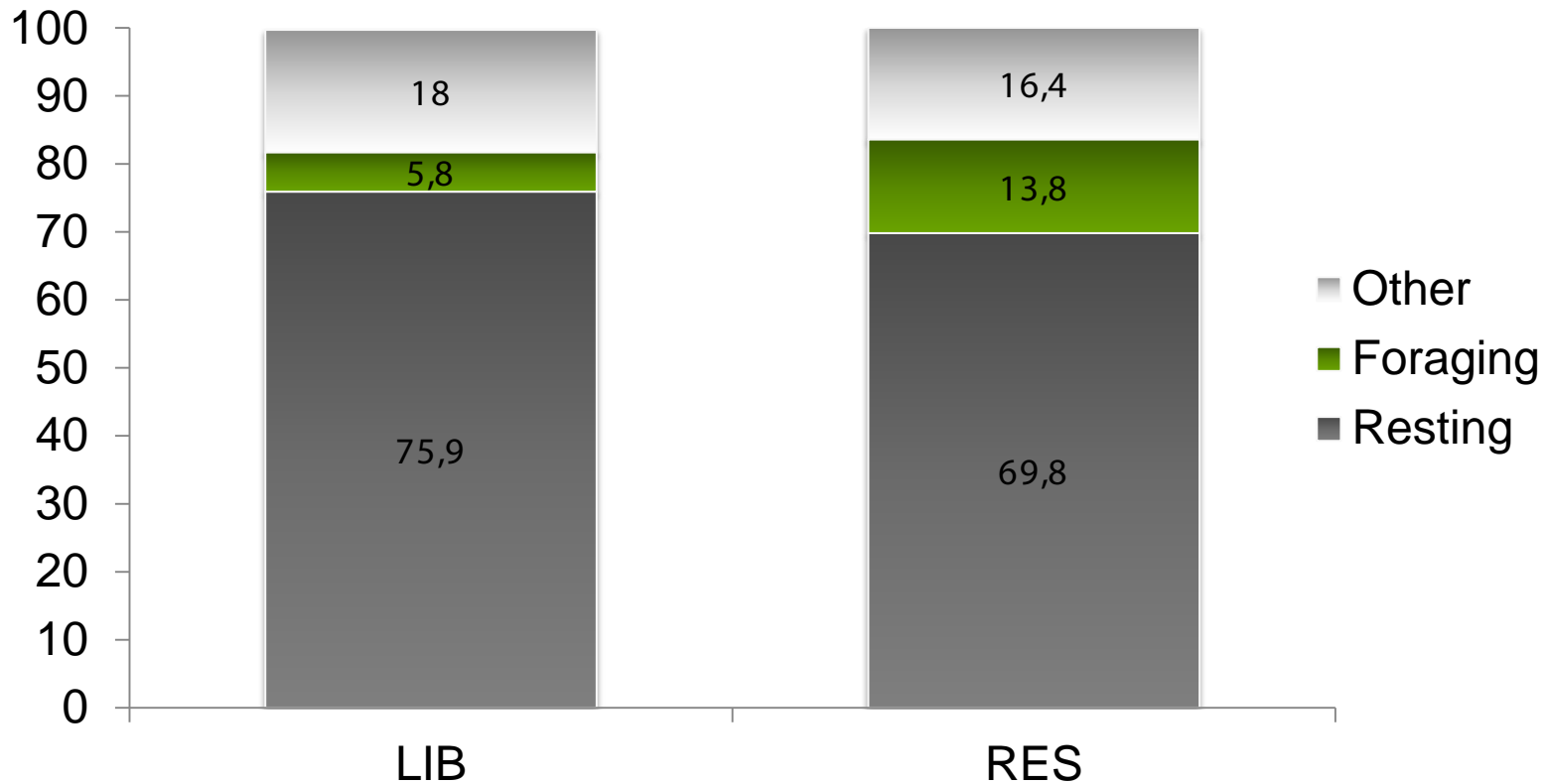


DAILY ENERGY INTAKE FROM CONCENTRATE - MJ ME PER PIG



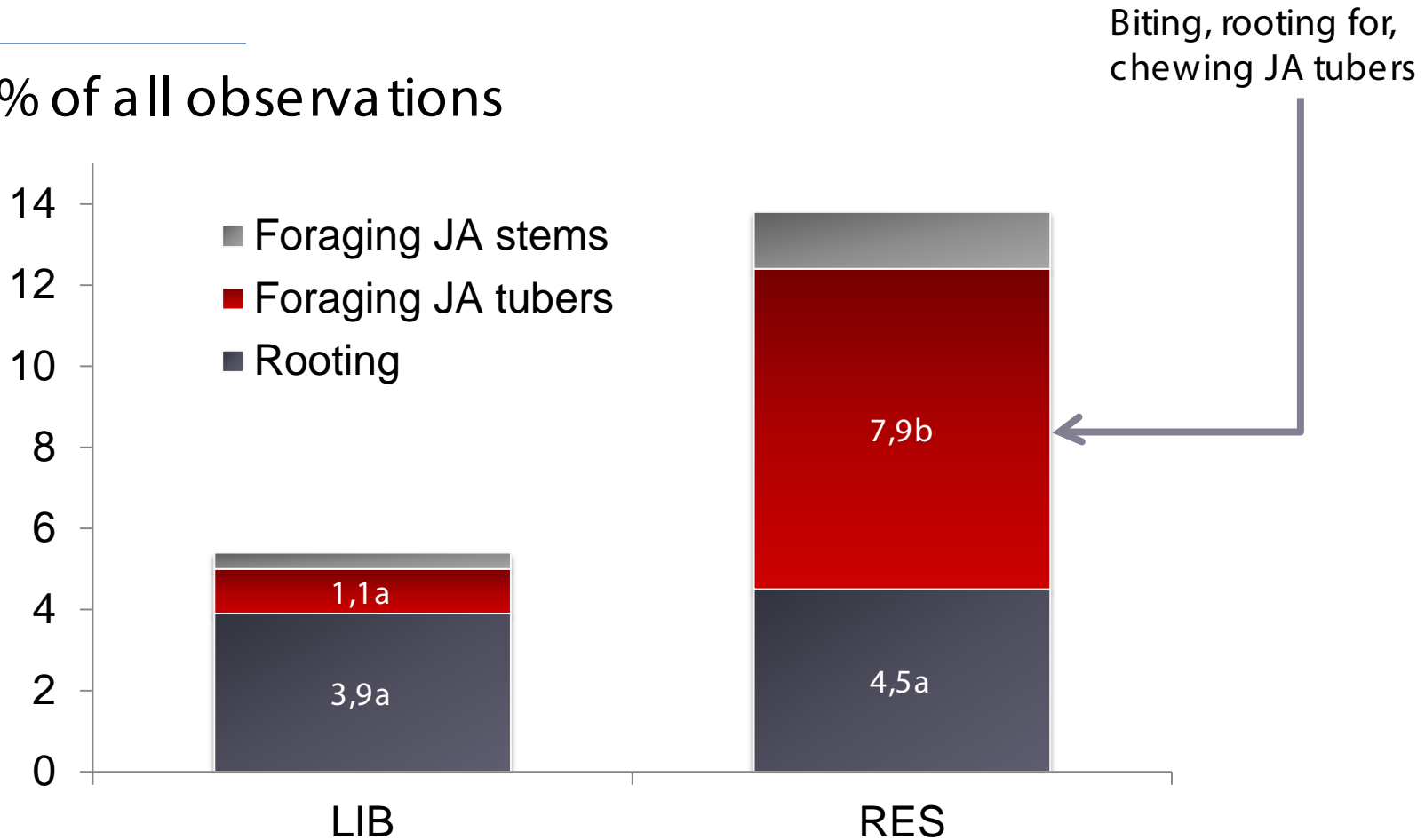
PIG BEHAVIOUR

% of all observations



FORAGING BEHAVIOUR

% of all observations

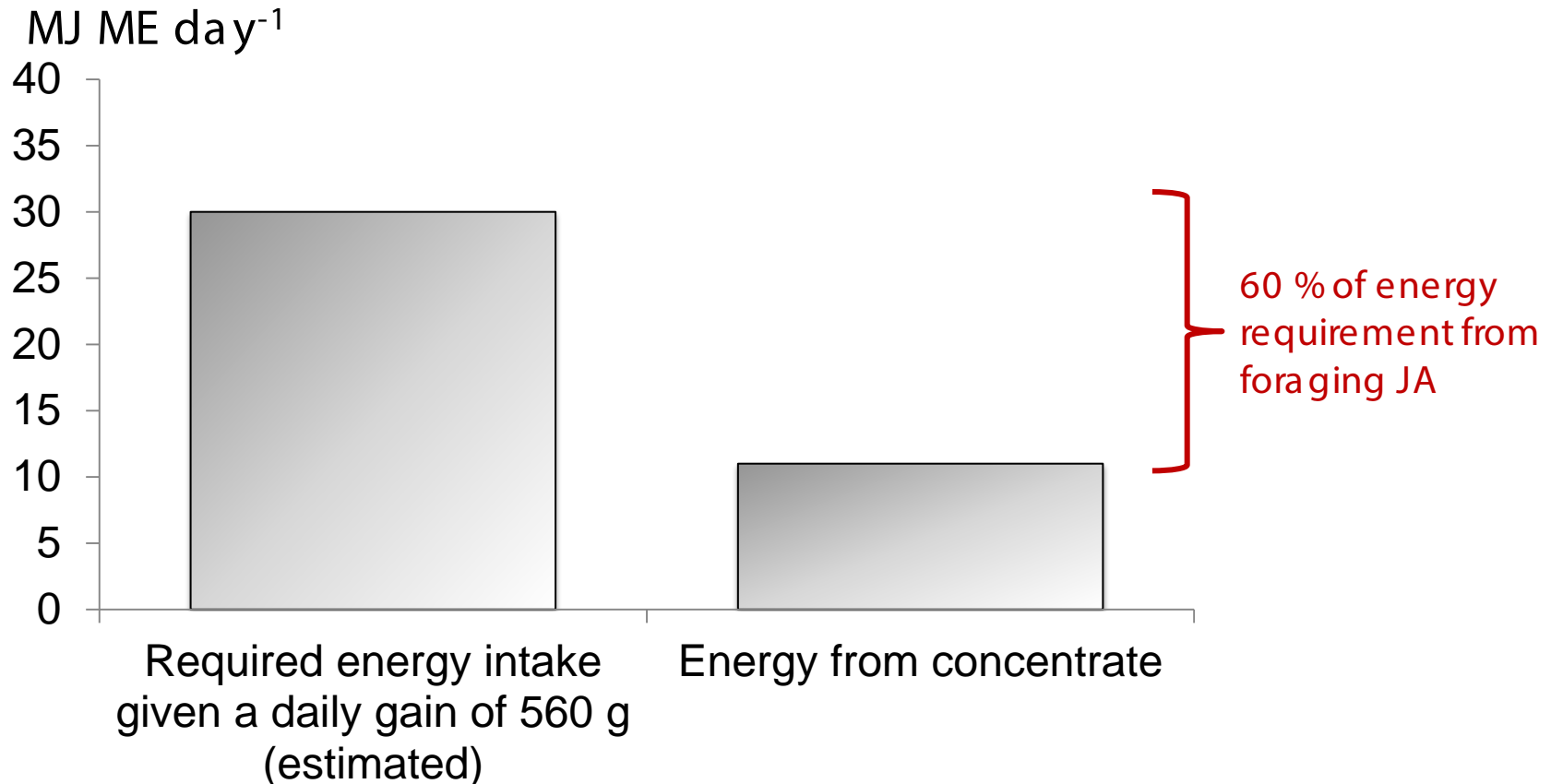


PERFORMANCE

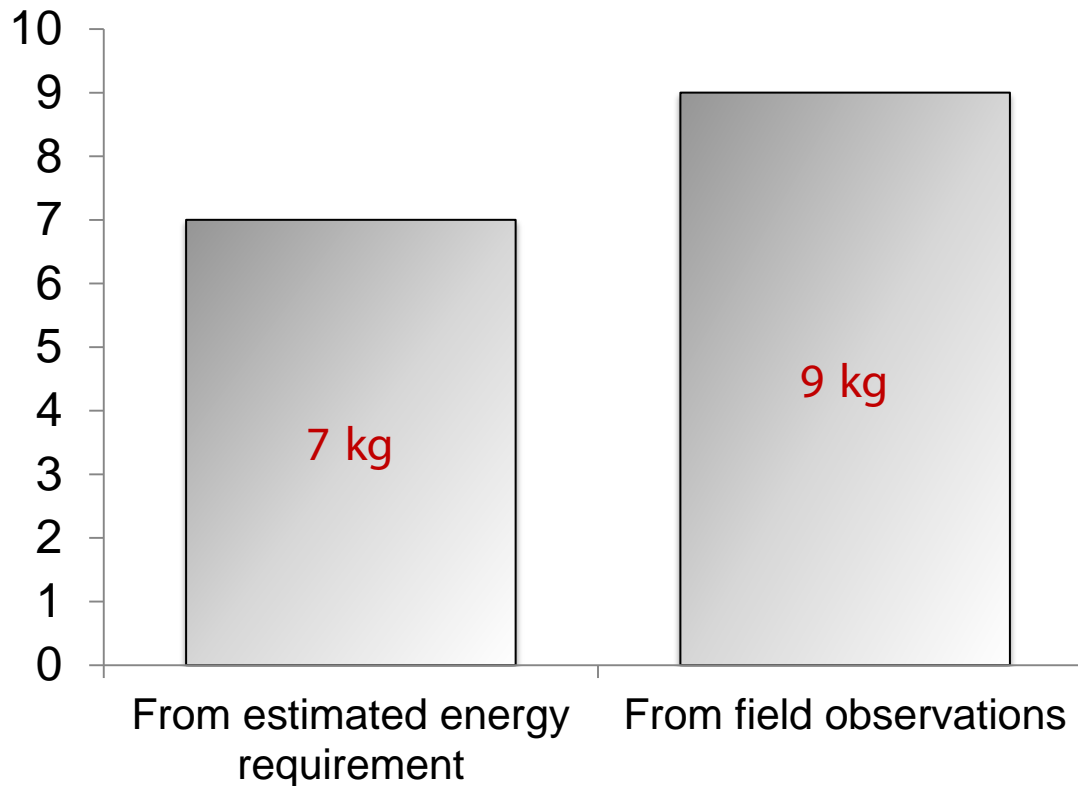
Treatment	Daily gain, g	Kg conc. per kg gain	Body condition
LIB	1,224 ^a	3.5 ^a	3.0
RES*	560 ^b	1.4 ^b	3.0
DIFF, %	÷ 54	÷ 60	0

* 78 % lower daily energy intake from concentrate

ESTIMATED ENERGY INTAKE FROM FORAGING JA



ESTIMATED DAILY INTAKE OF JA, KG FRESH WEIGHT



SUMMARY

- › A 78 % reduction in energy intake from concentrate (compared to *ad libitum*)
 - › More than doubled the foraging time
 - › Decreased daily gain with ~ 55 %
 - › Improved feed conversion ratio of concentrated feed with ~ 60 %
- › Approximately 60 % of daily energy requirement met from foraging JA
- › Daily intakes of 7-9 kg fresh weight (1.3 – 1.6 kg DM) JA tubers per pig!



CONCLUSIONS

- > Indicate that it is possible to substitute a large proportion of concentrates with home-grown JA tubers naturally harvested
- > Future studies are needed to find the most appropriate feeding strategy in relation to pig performance, meat quality, economy and nutrient balances
- > Read more: *Kongsted et al., 2013: Acta Agri Scand Sect A, Animal Science*



PART OF THE 'SUMMER' PROJECT

- SUPERB AND MARKETABLE MEAT FROM EFFICIENT AND ROBUST ANIMALS (SUMMER)
- OVERALL AIM IS TO INCREASE THE MARKET SHARE OF ORGANIC MEAT (PORK, POULTRY AND YOUNG BEEF)
- JOHN E. HERMANSEN PROJECT LEADER
- UNDER THE RDD PROGRAMME COORDINATED BY ICROFS
- FUNDED BY THE DANISH AGRIFISH AGENCY, MINISTRY OF FOOD, AGRICULTURE AND FISHERIES
- READ AND SEE MORE: [HTTP://AGRO.AU.DK/SUMMER/](http://agro.au.dk/summer/)

