



Lapin ammattikorkeakoulu

Aki Ranta, asiantuntija

Arktinen nokkonen – rikasta rahaksi

- Rahoitus
 - ❖ Pohjois-Pohjanmaan ELY-keskus on myöntänyt rahoituksen Euroopan aluekehitysrahastosta (EAKR)
 - ❖ Hankkeen kokonaisrahoitus 513 518 €, josta EAKR:n ja valtion osuus on 80% (410 813 €)
- Toteutusaika
 - ❖ 01.03.2020 – 30.09.2023
- Toteuttajat
 - ❖ Luonnonvarakeskus ja Lapin ammattikorkeakoulu
- Yhteistyössä
 - ❖ Ammattiopisto Lappia ja Paliskuntain yhdistys

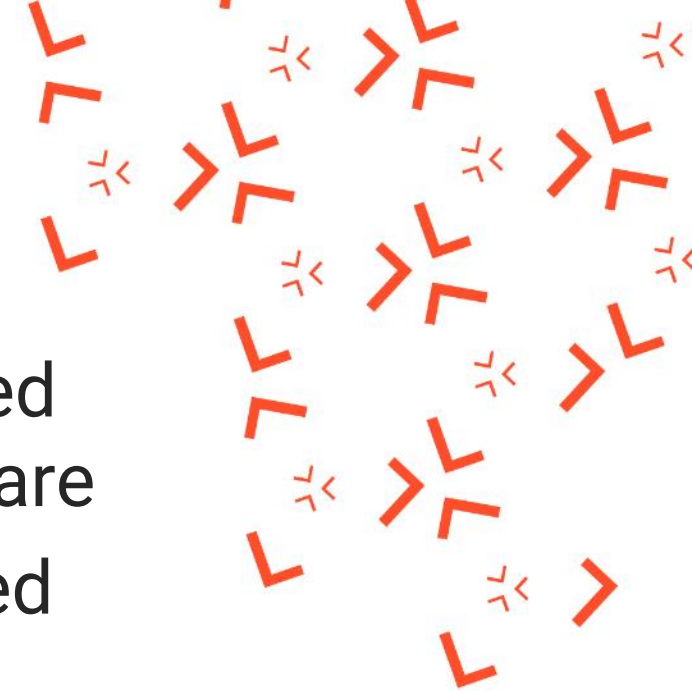


WP4 Reindeer supplementary feed

- Reindeer winter feeding is more and more required
 - Change of pasturing areas (lichen)
 - Different land users
- Winter feeding in fences at reindeer farms are common
- The risk of disease is increasing
- Quality of winter and spring feeding is critical for calving

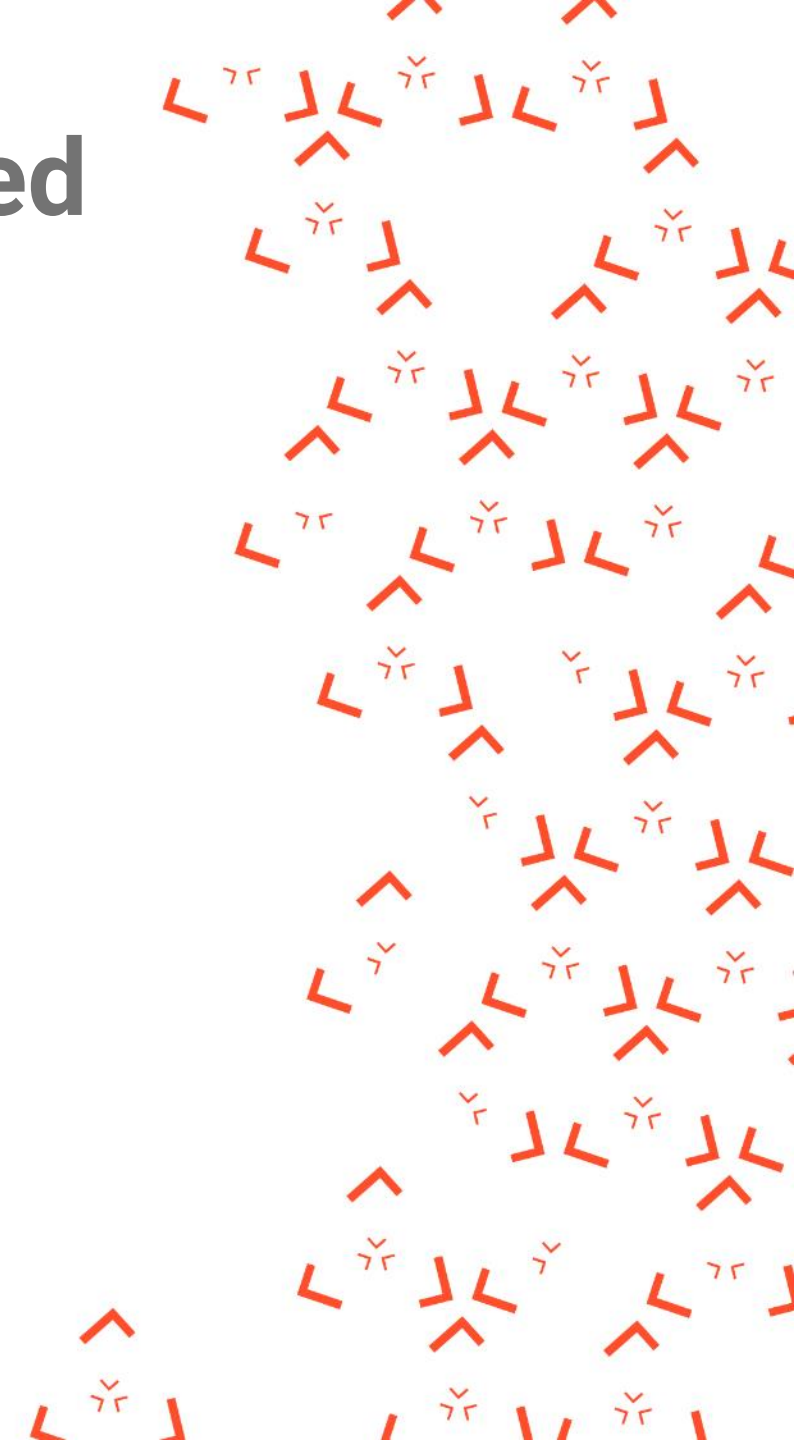
WP4 Reindeer supplementary feed

- New, domestic and cleaner alternatives are needed alongside basic feeds to improve the animal welfare
- Nettle has been traditionally used as ruminant feed supplement (rich in minerals, vitamins, bioactive compounds, protein) but so far there is no scientific evidence for its use in reindeer feeding



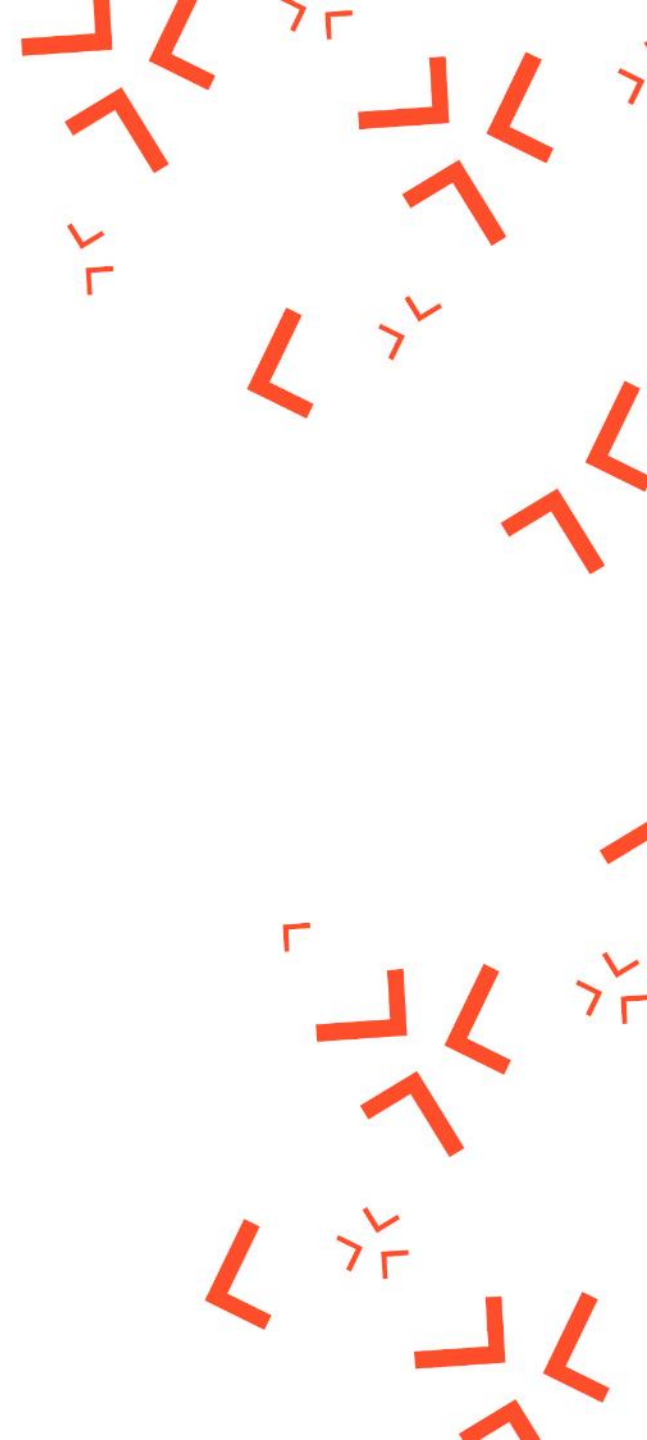
WP4 Reindeer supplementary feed

- Cafeteriatest 1
 - Nettle (whole plant)
 - Nettle leaves
 - Nettle powder (whole plant)
 - Birch leaves
 - Lichen
 - Nettle pellets (5% nettle)



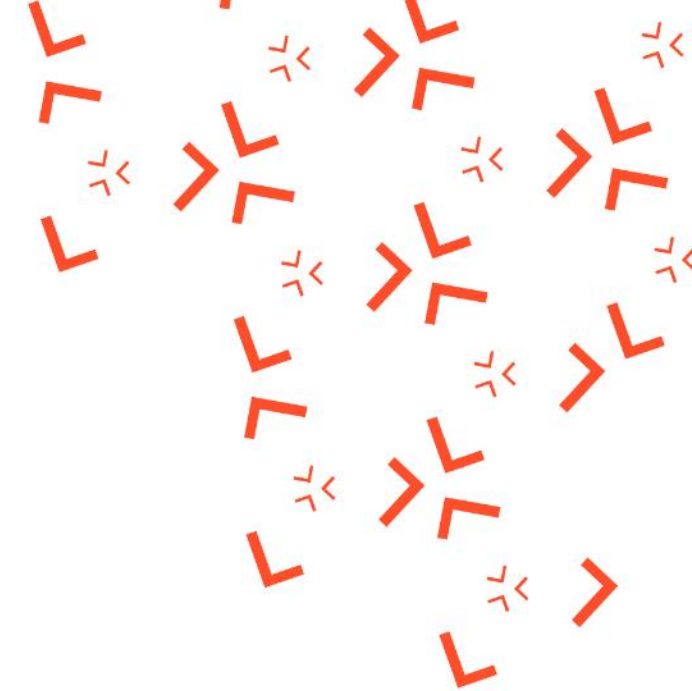
WP4 Reindeer supplementary feed

- Cafeteriatest 2
 - Nettle pellet (5% nettle)
 - Nettle pellet (10% nettle)
 - Nettle pellet (15% nettle)
 - Industrial feed pellet 1
 - Industrial feed pellet 2
 - Industrial feed pellet 3



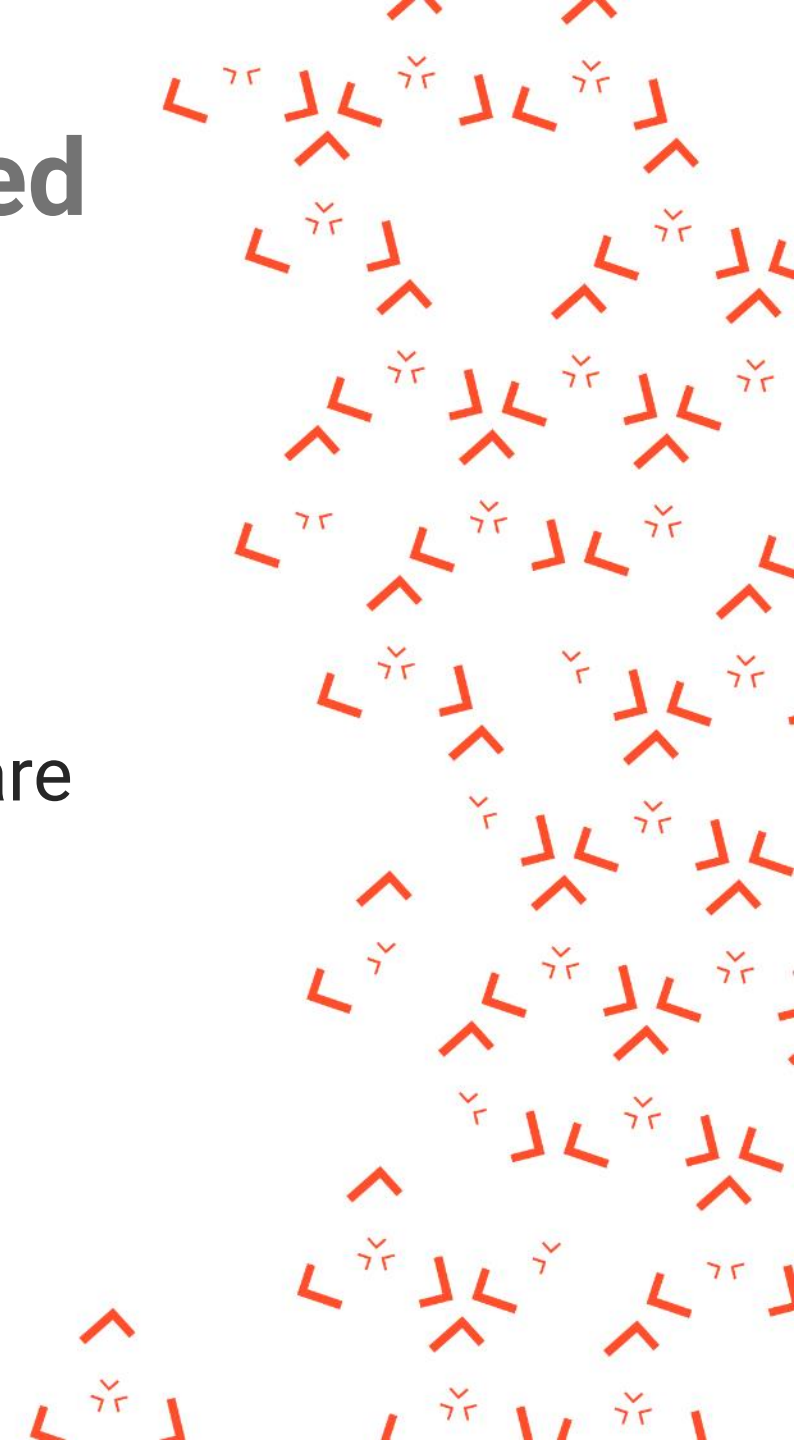
WP4 Reindeer supplementary feed

- Feeding experiment 01.12.2021 - 29.03.2022
- Feed analysis
- Animal welfare monitoring
- Blood analysis



WP4 Reindeer supplementary feed

- Three groups of reindeers (9 females each)
 - Research group
 - Control group
 - Forest feeding group
- Reindeers in different groups chosen so they are equal (weight, age, condition)
- Reindeer ages between 2,5–9,5 years
- No calfs anymore when experiment started





WP4 Reindeer supplementary feed

- Before experiment reindeers have pastured at forest (Sinioivi area)
- Supplementary feeding started at november when pasturing conditions weakened
 - industrial feed pellet and silage
- Anyhow chosen reindeers were in normal condition according to the season



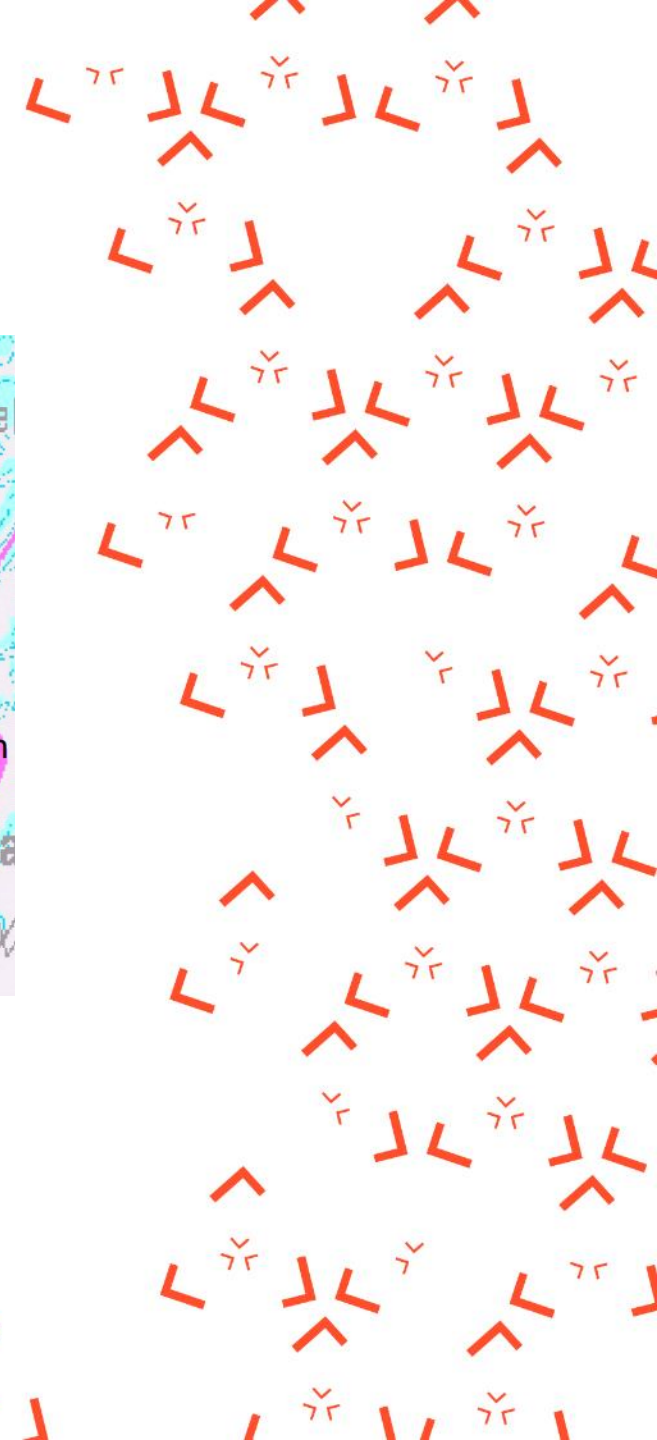
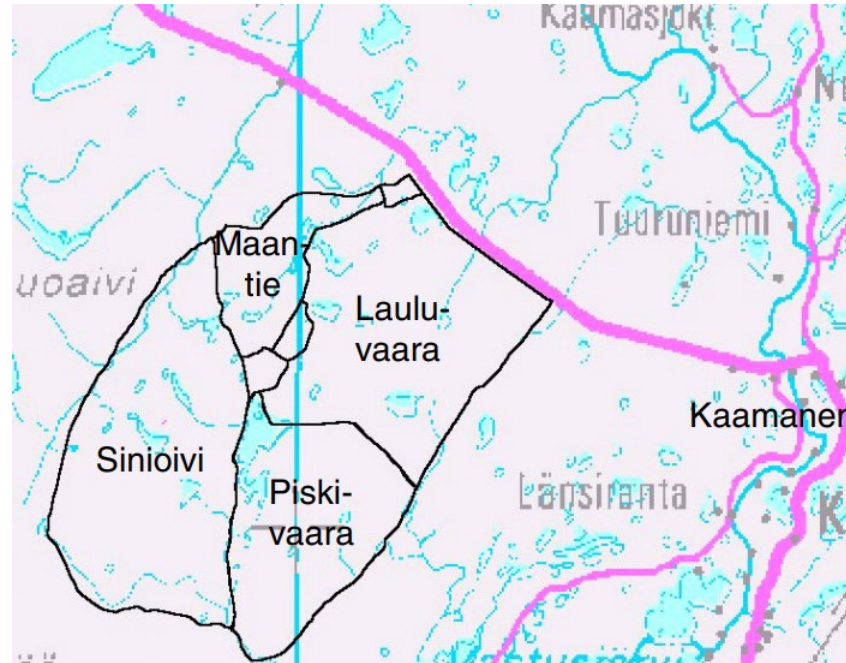
WP4 Reindeer supplementary feed

- Feeding
- Research and control groups
 - 1.12.2021 - 7.12.2021 20 kg feed pellet (each group per day)
 - 8.12.2021 - 12.1.2022 25 kg feed pellet
 - 13.1.2022 - 28.3.2022 18 kg feed pellet
- Forest feeding group
 - 0,7 kg industrial feed pellet and 1,7 kg silage (each reindeer per day)
- Feeding pellets and leftovers scaled every day



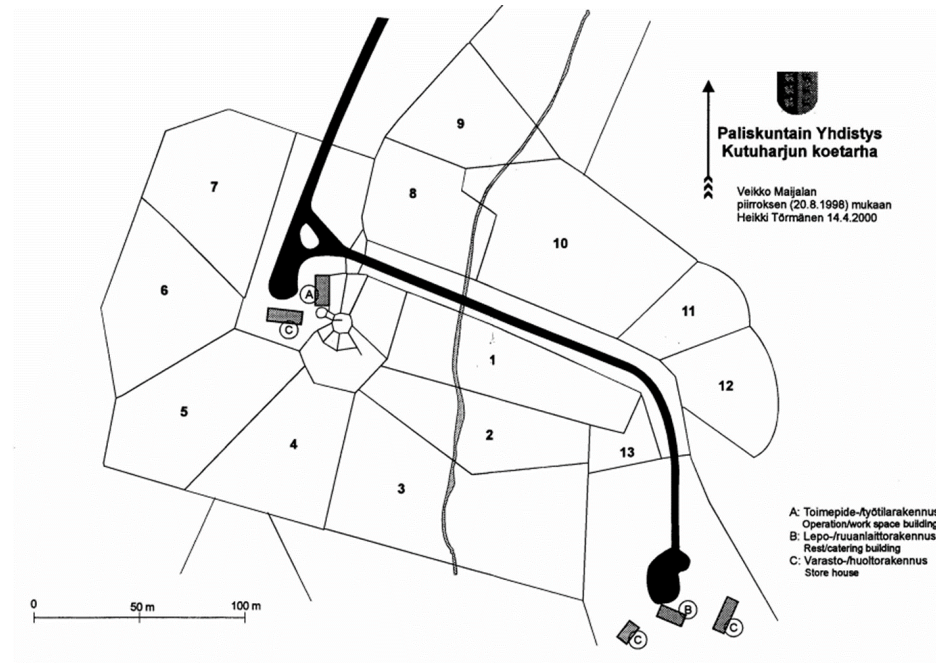
WP4 Reindeer supplementary feed

- Experiments done in Reindeer Herders' Association Kutuharju field research station.
- Most of the types of vegetation found in reindeer husbandry area can be found in the Kutuharju area.
- The total area of the station is 43 km² and it has been divided into four different areas: Lauuvaara, Sinioivi, Piskivaara and Maantielohko.



WP4 Reindeer supplementary feed

- Research station have also 13 separated small feeding areas.
- Feeding experiments for research and control groups have done in these areas (6 and 7)
- Forest feeding group pastured at Lauluvaara and Piskivaara areas.





WP4 Reindeer supplementary feed

- Reindeers weight measured at start of experiment 1.12.2021, at middle 17.1.2022 and at the end 29.3.2022.
- Blood samples taken from vein in neck at the beginning and at the end of experiment.





WP4 Reindeer supplementary feed

- Research group feeding pellets were same industrial feeding pellets than the other groups, but there was 5 % of nettle powder in it. In the research feed, oat bran had been replaced with nettle. Feed have been produced by Lantmännen agro in Kouvola.



WP4 Reindeer supplementary feed

- At the beginning of the experiment there were troubles with reindeer hierarchy. We had to react and give more feed for research and control groups than the original plan. Before reindeer that were low in hierarchy didn't get enough feed because of dominating individuals. After dominating decreased and every reindeer could eat in peace.

WP4 Reindeer supplementary feed

- In research and control group reindeers condition and weight increased, because they get more energy from feeding than recommended.

	Kuntoluokka		29.3.2022	Keskihajonta	Erotus	P arvo
	1.12.2021	Keskihajonta				
Maastoryhmä	2,94	0,10	2,69	0,37	-0,25	0,090
Kontrolliryhmä	2,83	0,31	3,72	0,18	0,89	0,000
Tutkimusryhmä	2,96	0,19	3,69	0,23	0,74	0,000
T-testi Tutkimus- ja kontrolliryhmän välillä kuntoluokan muutoksen erosta P arvo oli 0,24						

	1.12.2021	Keskihajonta	29.3.2022	Keskihajonta	Erotus	P arvo
	Maastoryhmä	79,8	4,61	76,3	7,60	-3,44
Kontrolliryhmä	74,4	6,85	80,2	7,97	5,78	0,000
Tutkimusryhmä	77,9	8,31	82,3	7,80	4,44	0,140
T-testi Tutkimus- ja kontrolliryhmän välillä painojen muutoksen erosta P arvo oli 0,31						

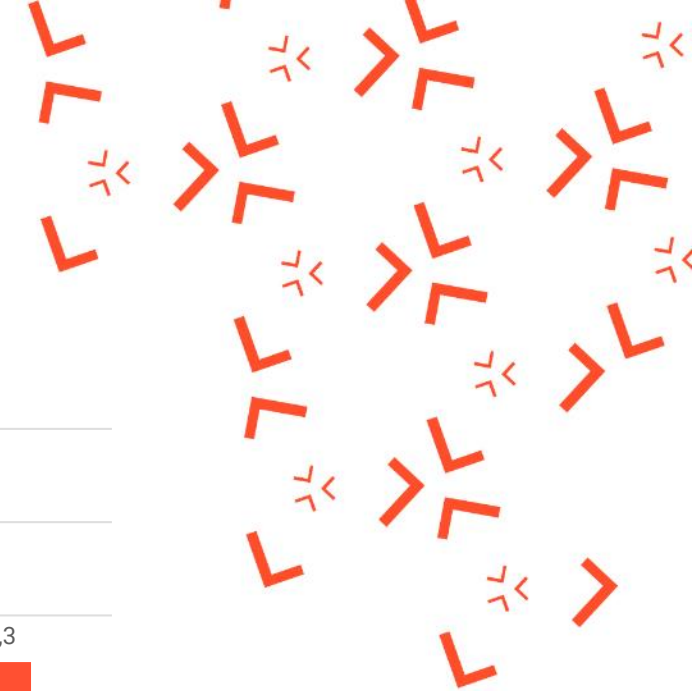
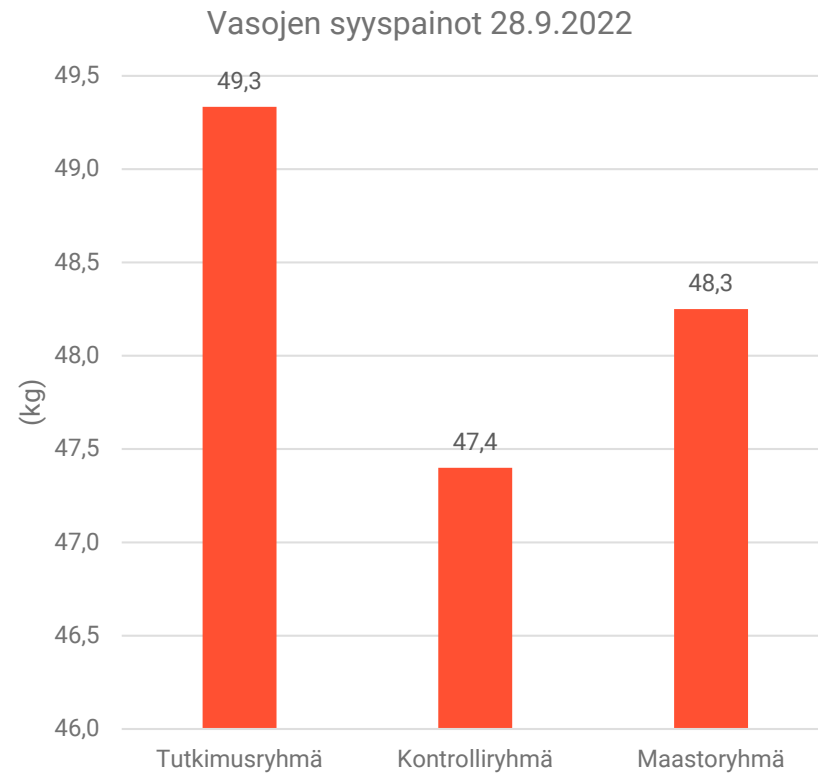
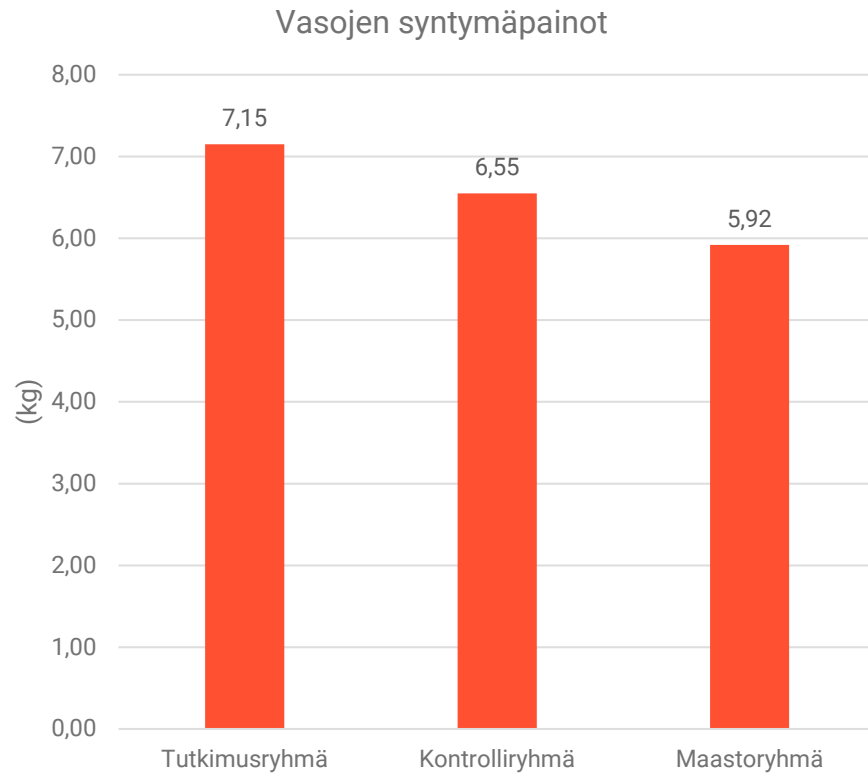
WP4 Reindeer supplementary feed

- Reindeer condition measuring is in four levels (1-4). In level 1 reindeer is very thin and dry, in level 2 reindeer is thin, in level 3 reindeer is in normal condition, in level 4 reindeer is overweighted.
- Typically reindeer weight can decrease 10-20 % from autumn to spring, without causing any harm to reindeer welfare.

WP4 Reindeer supplementary feed

- In research and control groups birth weight of the calves were above normal. In forest feeding group the calves birth weight was normal.
- In research and control groups reindeers had to much energy from feeding and that increased the birth weight of the calves. Too high birth weights can increase risks of calving.

WP4 Reindeer supplementary feed



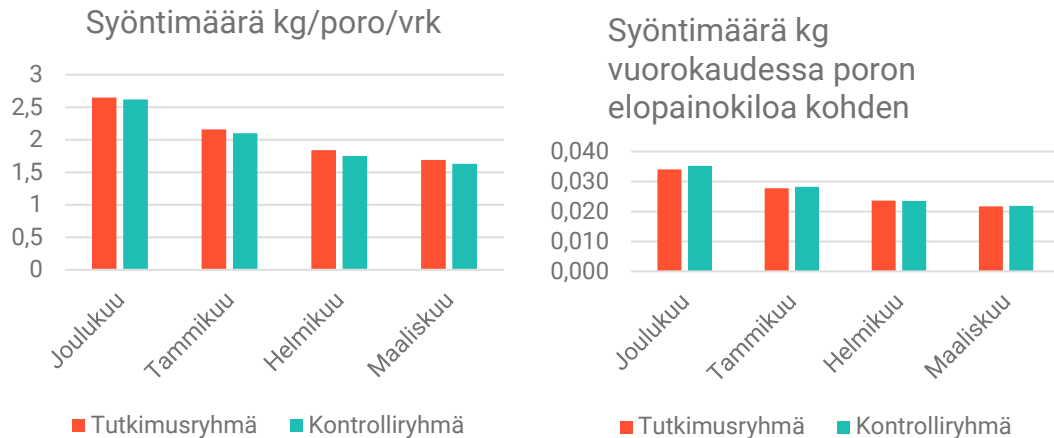
WP4 Reindeer supplementary feed

- Blood values was mainly getting better by the end of experiment in research and control groups. In forest feeding group there was not as clear changes.
- Effect of nettle in feed was clarified by blood values at the end of the feeding trial. If the values was statistically significantly different between research and control groups.



WP4 Reindeer supplementary feed

- Research and control groups didn't have clear difference in feed palatability. They eat both feeds almost same amount.



WP4 Reindeer supplementary feed

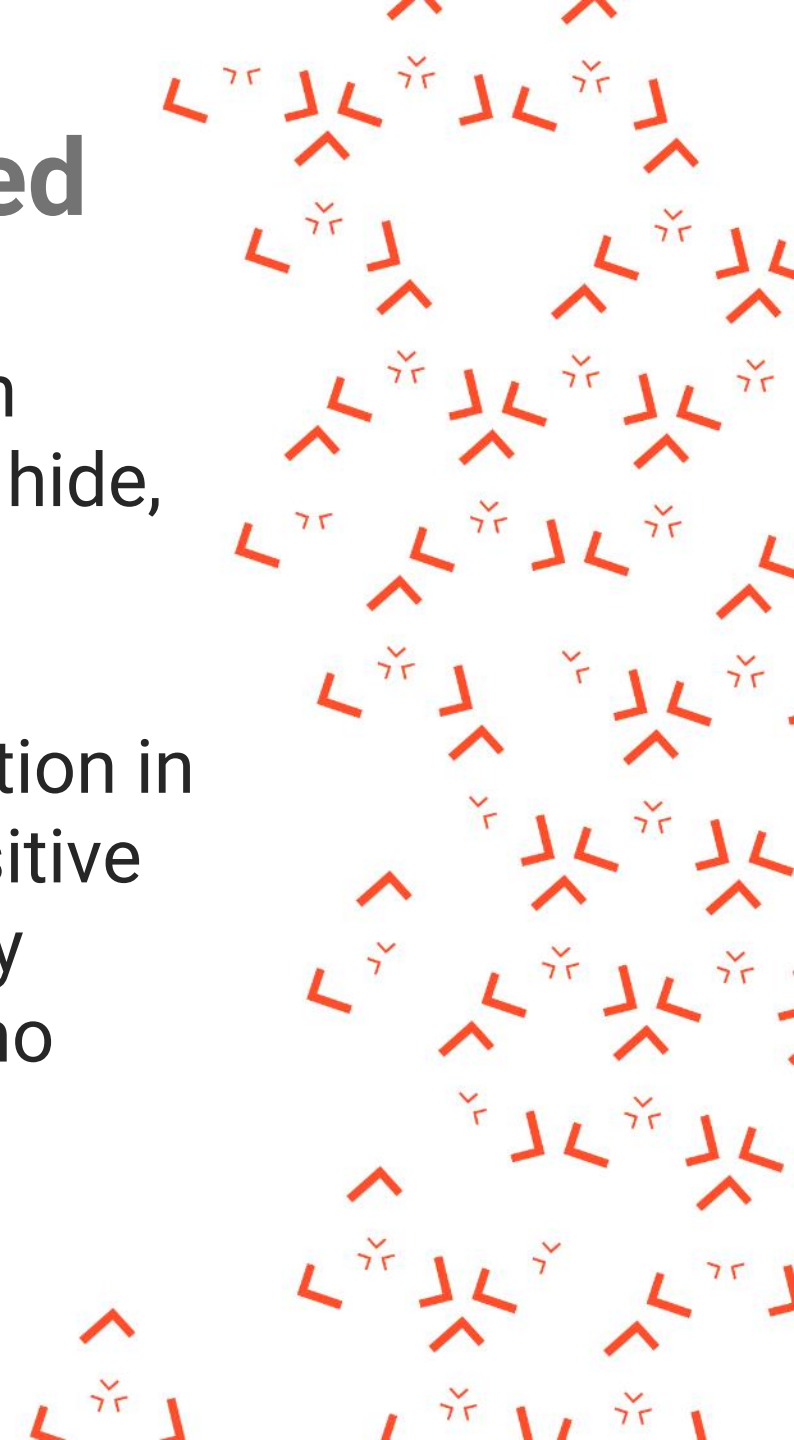
- Feed digestibility was good.
- There was no significant harmful effects from including 5% nettle to feed.

	Analyysi_ka	In vitro org-aineen sulavuus, D-arvo	In vitro org-aineen sulavuus	In vitro org-aineen liukoisuus	NDF_Ankom	JOK2002,Kok-N,	Tuhka
	Ka (DM)	D-arvo	In vitro OMD	Sellulaasiliukoisuus	NDF	Raakavalkua-	Tuhka
	%	g/kg ka	g/kg OM	g/kg OM	g/kg ka	g/kg ka	g/kg ka
Tutkimusrehu	94,0	806	860	921	278	125	62,9
Kontrollirehu	94,0	813	870	933	247	128	65,1
Kuivattu nokkonen	92,5	706	829	887	256	144	148,9

	Ca	Cu	Fe	K	Mg	Mn	Na	P	S	Zn	Nitraatti_N
	g/kg ka	mg/kg ka	mg/kg ka	g/kg ka	g/kg ka	mg/kg ka	g/kg ka	g/kg ka	g/kg ka	mg/kg ka	NO3-N
											mg/kg ik
Tutkimusrehu	7,8	27,0	53,0	8,7	3,6	89,5	2,7	4,0	2,1	110,0	130,4
Kontrollirehu	9,1	27,5	37,5	7,9	3,6	86,5	3,7	4,2	2,0	105,0	40,3
Kuivattu nokkonen	32,4	6,3	62,0	23,4	8,2	39,0	0,06	4,8	5,0	18,0	200,2

WP4 Reindeer supplementary feed

- By results of this experiment including nettle in reindeer feed have positive effects to reindeer hide, blood values and general welfare.
- In research group reindeers hides was better condition and shiny. Hides were in good condition in other groups also. It looks that nettle have positive effect to hide. Estimation was made by visually judgement without accesories, so results are no exact.



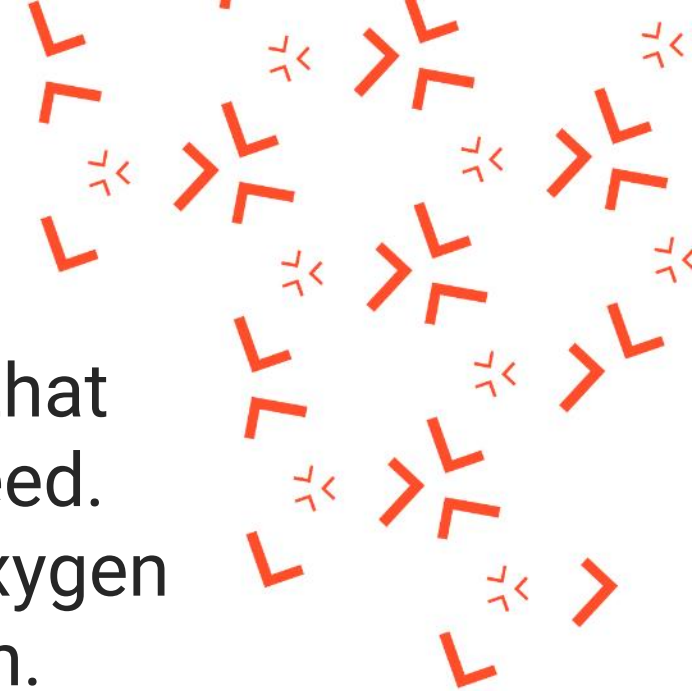


WP4 Reindeer supplementary feed

- By results of this experiment it is not profitable to feed reindeers with industrial feed pellets including nettle with current nettle prices.
- In case reindeers are used mainly for meat production.

WP4 Reindeer supplementary feed

- When reindeers are used for racing is it possible that you can have advantage from nettle in reindeer feed. Nettle increase hemoglobin and then improves oxygen uptake. When racing, reindeer oxygen need is high.
- When reindeers are used for tourism is important that reindeers are in good condition and look good. Nettle in reindeer feed have positive effect on reindeer hides in this experiment.



FIND MORE

- [General Brochures](#)
- [Porojen talviruokinnan hyvien toimintatapojen opas](#)
- [Säiliörehut porojen ruokinnassa](#)
- [Porojen hätäruokinta ja hoito](#)



POHJOISTA TEKOA

LAPIN AMK⁷
Lapland University of Applied Sciences

www.lapinamk.fi