

EALLU

Arctic Indigenous Peoples' Food Systems: Youth, Knowledge & Change 2015-2019



**An Arctic Council Sustainable Development Working
Group Report from the EALLU Project in 2015-2019.**

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EALLU

Arctic Indigenous Peoples' Food Systems: Youth, Knowledge & Change 2015-2019

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Disclaimer

This project was undertaken as an approved project of the Arctic Council Sustainable Development Working Group. The project report was prepared by a project team and does not necessarily reflect the policy or positions of any Arctic State, Permanent Participant or Observer of the Arctic Council.



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1. FOREWORD AND INTRODUCTION

This book is the report from the Arctic Council EALLU project 2015-2019 (SDWG EALLU: Indigenous Youth, Arctic Change and Food Culture). This project has been co-led by Canada, Denmark/Greenland, Norway, Russia, USA, the Aleut International Association and the Saami Council, and is managed by the Association of World Reindeer Herders (WRH) and the International Centre for Reindeer Husbandry (ICR).

A central aspect of the project is that it is co-managed by Indigenous youth themselves, as a capacity building effort for indigenous peoples facing Arctic change. Therefore, Arctic indigenous youth have taken active part in the planning, implementation and reporting of EALLU.

The EALLU project is a direct follow-up of earlier projects of the Arctic Council, notably the SDWG/ IPY EALÁT Reindeer Herding, Traditional Knowledge and Adaptation to Climate Change and Loss of Pastures Project 2007- 2011 (Magga et al 2011) and the EALLIN Reindeer Herding Youth Project 2012-2015 (Pogodaev, et al 2015).

This report builds on the former SDWG EALLU food book deliverable for the Arctic Council Ministerial Meeting in Fairbanks, May 11, 2017, entitled “*EALLU – Indigenous Youth, Food Knowledge & Arctic Change*” (Burgess et al, 2017), made by our group of pan-Arctic indigenous youth. At the 23rd International Gourmand Awards in Yantai, China May 26, 2018, this book won the award for the *Best Food Book of the World, Across All Categories* in competition with 1 372 other books from over 70 States. And therefore one can also credibly claim that the food cultures of Arctic indigenous peoples and the work of our indigenous youth represents excellent skills, with a demonstrated global potential.

EALLU combine our understanding of Arctic change and our methodology of indigenous youth engagement with a focus on food, traditional indigenous knowledge, economic and societal development, and youth leadership.

The EALLU project is a follow-up of points #14 and #22 of the Fairbanks Declaration on the occasion of the 10th Arctic Council Ministerial Meeting in Fairbanks, Alaska, May 15, 2017, that states, respectively:

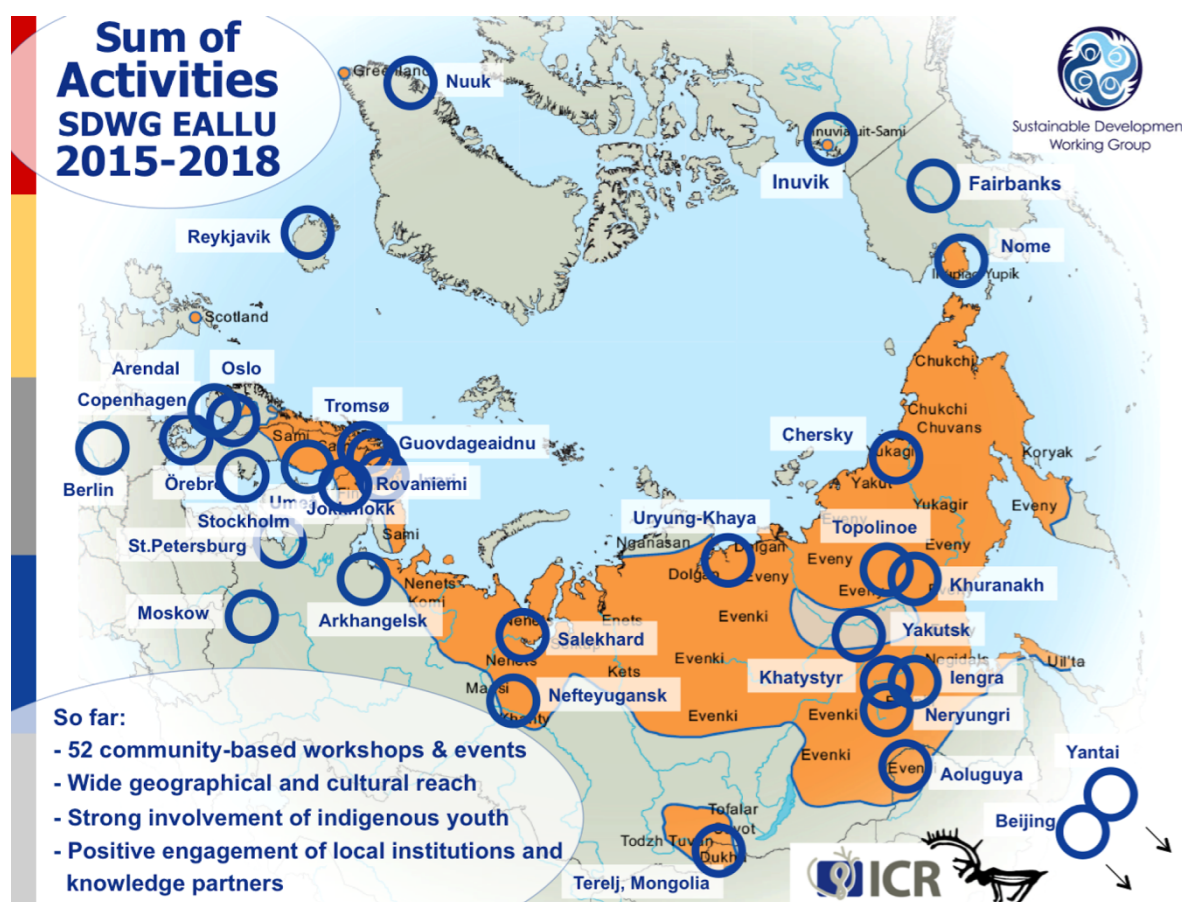
*[we] “...**Recognize** the vital importance of healthy Arctic communities, homes and peoples, and the essential role of the human and social dimension in the work of the Arctic Council, **welcome** reports and policy recommendations on food security and culture, (...) and **encourage** continued work on these issues”.*

*[we] “...**Encourage** the establishment of a program for training indigenous youth in the documentation of traditional knowledge related to food, food entrepreneurship and innovation”.*

The EALLU project is also a follow up of point #22 of the Iqaluit Declaration on the occasion of the 9th Arctic Council Ministerial Meeting in Iqaluit, Canada, April 24 2015, that states:

[we] “...**Welcome** the work of the Arctic Council on reindeer herding and youth, and further **welcome** the promotion of food culture and leadership opportunities for Indigenous youth”.

The content in this report is based on a series of 53 separate SDWG EALLU youth seminars, community-based workshops, student events, science seminars, business gatherings, food exhibitions and so on, held by the project throughout the circumpolar north in 2015-2019. The following map shows an overview of the activity (on top of a map of world reindeer herding areas):



Multiple drivers of environmental and social change are now evident across the Arctic, including climate change, changed use of the Arctic, globalization and increasing human activity. In some northern parts of Fennoscandia for instance, increase in air temperature in spring (March-May) have been 3 degrees Celsius (Eira et al, 2018). Changes in terms of land use change and biodiversity are also observed (Maggia et al, 2011; Degteva et al, 2018). Today the Arctic is changing in ways unprecedented in our long histories in the north, challenging indigenous peoples' traditional ways of life, our

wellbeing, our food security and food sovereignty. The combination of these rapid changes occurring simultaneously constitutes a legitimate concern for the future of traditional indigenous livelihoods and peoples (Burgess et al, 2017). And, these changes occur on top of many other challenges that indigenous peoples' societies are already facing.

Climate change and globalization is also about what we are going to eat in the future (Burgess et al, 2017). We have a very rich understanding of food, with a lot of unique flavors and knowledge, but this culinary world has largely been 'hidden' for the outside. And in other ways it is still hidden, as far as it is overlooked, misunderstood and assimilated, and the experience shows that there can sometimes even be a danger of peoples looking down on their own food culture. It takes real work, real resources and real will to maintain (and develop) our food cultures, our traditions and our knowledge. There is a need for transformative change to keep our ways and knowledge in face of an ever more rapidly changing Arctic. This however must be driven from inside our own societies, communities and families, and re-coupling our traditional indigenous knowledge into our economy and food systems.

Arctic food is of essence for human health, and key for a healthy life in the north. Observed dietary shifts in the Arctic cause concerns (Burgess et al, 2017). While the mediterranean diet is well known, less has been known about the diet of Arctic indigenous peoples. Health is an integral part of our understanding of food security, as is biodiversity, in itself representing a core building block of Arctic indigenous peoples' food systems. Utilizing traditionally relatively simple production environments, with relatively few ingredients, Arctic indigenous peoples' diets are typically more characterized by high levels of protein and (polyunsaturated) fat, and low levels of carbohydrates.

Arctic indigenous peoples have strong traditions for utilizing resources fully without waste, deeply engraved in our food cultures, and what we have referred to as real sustainability. Where the world is now focusing increasingly on the concept of circular economy, the economies and traditional livelihoods of Arctic indigenous peoples have always been circular: We should use everything, and take only what we need. In our understanding, indigenous peoples' traditional livelihoods are the oldest and best performing part of circular economy, from which lessons for the world could be gained.

As for food culture and nomadism, ie. indigenous reindeer pastoralism, some observations can be made. The whole knowledge base of reindeer herders is based on mobility, ie. moving with the herd, and so the food system of reindeer herders is also nomadic. This is for instance reflected in the Sámi term *niesteboazu*, which is basically a reindeer (*boazu*) that you would slaughter and consume while migrating. Today, the meaning of the term may have shifted somewhat, but the original meaning was linked to the nomadic food system.

Food security is fundamentally about securing food resources for human consumption. Our understanding of food security is that it must be based on Arctic Indigenous Peoples' equitable access and possibilities to select our own resources, food

empowerment through the utilization of our own knowledge, the sustainable use of all resources in accordance with our traditional food systems, food safety regimes adapted to Arctic realities and Indigenous cultures, health and well-being, and local economic development and value-added from within our own societies. In short, a full and meaningful enactment of Arctic food sovereignty (Burgess et al, 2017).

Another important sphere is that of economy and business opportunities. Traditional ways of life and livelihoods have been and are central to the economies of Arctic indigenous peoples. At the same time, the food resources and production from these traditional livelihoods are often little known outside, while they are much in line with global food trends. Examples of such trends could be origins, health, organic foods, ethnic roots and so on. In addition comes trends relating to tourism, where Arctic tourism is currently seeing an upswing in many regions. As far as there is an abundance of food resources and food security, there are good reasons to assume that indigenous peoples' food products can have a positive market potential. Indeed, revitalizing traditional food products for modern markets can be a good way of generating local value added and businesses in the food sector (Reinert 1997, in Burgess et al, 2017), which have for instance been the basis of food business development programs in Norway.

In order to ensure successful adaptation also for indigenous peoples and their traditional livelihoods and societies, one must make sure that they are also able to make use of the *opportunities* arising from Arctic change. This is part of what the Arctic Council EALLU project attempts to facilitate, to make sure that an opportunity of a changing Arctic is an opportunity for all - and thereby, in other words, leaving no one behind.

It is however not enough to discuss the opportunities, but also what obstacles prevent opportunities becoming real also for Arctic indigenous peoples and communities. The general situation with demanding external Arctic change is a key issue. Simultaneously there are also other factors, perhaps of more internal nature, such as the need to praise those who are willing and able to succeed as food innovators and entrepreneurs. There is a need for more arenas to do this, which is one of the reasons why the EALLU team is proposing an *Arctic Indigenous Peoples' Food Festival*.

Along the same line of thought, there is a potential for making use of current restaurant and food trends, in our own way. One example could be that of pop-up restaurants. While we believe innovation and food fusion are not to be feared - that is, as long as you have your own traditions straight - we believe making an innovative *Nomadic Pop-up Restaurant* for blending and combining different "ways of knowing" and "ways of cooking" could be an interesting way forward. This could be good for attracting and keeping our talented youth, for keeping them interested in their own traditions, for bringing forth our own knowledge in a modern context, and thus also for building our own economies. This is in focus for our Arctic Indigenous Peoples' Culinary Institute.

Traditional indigenous knowledge represents systematic knowledge that has been obtained, developed, stored and transferred within self-governing systems of indigenous

peoples, which distinguish it from local knowledge. This means that the knowledge is based on another way of knowing, another way of learning, and a family-based context of transmission. Knowledge grows roots where it is developed and used (Turi J.M, in Oskal et al, 2009), and while traditional indigenous knowledge is often contextual, it can also be a universal knowledge. An important aspiration of EALLU is to explore how we can use our own knowledge to build our own societies, based on our own premises, our own resources, and our own people. And this is necessary as we see the challenges of global changes in the north “...to be of such proportions that we need to use the best available knowledge to adapt” (Magga et al, 2011:39), where both traditional indigenous knowledge as well as science must be put to full use. Likewise, the potential for integrated observation systems also within the field of food should be explored (cf. SAON).

As noted by Gourmand International, and highlighted when EALLU won the Gourmand Awards main prize in 2018, part of the significance of EALLU lies in that this food knowledge has not been documented, nor shared or fully understood by the outside world. And indeed we can safely conclude that what our indigenous youth have documented through the EALLU project, most of which has never been documented before, merely represents scratching the surface of the vast body of food knowledge of Arctic indigenous peoples.

Mainstream society and the global community are well acquainted with eg. the mediterranean diet including its health benefits, and recently the EAT-Lancet report on a global healthy and sustainable diet was launched. However, little is known about the food of Arctic indigenous peoples. Looking at our own food cultures and culinary traditions, representing the least explored part of world cuisine today, this is what we entitle “*the Arctic diet*”.

2. PROJECT RECOMMENDATIONS AND OPTIONS

Based on the implementation of the EALLU project in 2015-2019, we are:

Noting the range of ongoing profound changes in the Arctic not witnessed before in the long histories of Arctic Indigenous Peoples,

Mindful of the 2018 IPCC 1,5 degree report, underlining that parts of the Arctic have already seen a warming of over 3 degrees in springtime,

Recognizing that climate change is also about what we are going to eat in the future,

Keeping in mind the variable contexts of ‘our different Arctics’,

Recognizing that economic freedom of Indigenous societies is a key foundation for their adaptation to Arctic change, and that any civilization is dependent on using the knowledge of its people to build its own societies,

Acknowledging that culture develops from food production systems, and food connects and reminds us where we come from, who we are, and where we belong, and underline that food is one of the strongest carriers of knowledge and identity,

Understanding that the traditional food knowledge of Arctic indigenous peoples can be the best in the world, and that it can achieve global attention and interest,

Recognizing that the rich understanding and knowledge-base Arctic Indigenous Peoples food has not been fully utilized for innovation and local economic development, and that it thus represents an untapped resource for Indigenous Peoples’ societies’ self-sufficiency, prosperity and adaptation to Arctic change, and underline the key importance of Indigenous languages and traditional knowledge.

Recognizing the need for improvement of the economic basis of indigenous peoples’ traditional livelihoods by securing their access and ownership to the most profitable activities in their value chains, fair trade, and special branding systems,

Underlining that illegitimate imitation of traditional food products can reduce and discredit indigenous peoples’ markets, which in turn can weaken their knowledge base, intellectual property, as well as their economy, and furthermore constitute inappropriate representation of indigenous cultures,

Underlining that traditional livelihoods of Arctic indigenous peoples have represented original circular economies, while this connection has been weakened the last decades due to “modernisation”, assimilation, lack of knowledge and various other reasons, noting with interest that the increasing global focus on circular economy in some ways signifies a return to indigenous peoples’ way of thinking and models,

Recognizing the importance of the UN SDGs for Arctic indigenous peoples’ food systems, biodiversity, and for driving needed transformative change and adaptation, while underlining the core principle of leaving no one behind,

Noting the upcoming Lancet-EAT report proposing for the first time scientific targets for what constitutes both a healthy diet and a sustainable food system, and noting that recent studies show that methane emissions are low in reindeer that are fed lichen,

Recognizing that indigenous peoples historically based their existence on holistic economic systems, where diversity and utilization of marginal resources are typically at the core, systems that are integrated and expressed in our cultures and based on our Traditional Indigenous Knowledge, and underlining that it is very important that this holistic system is properly understood and taken into account in public management, governance and regulatory systems on food,

Noting that traditional indigenous livelihoods are often founded on traditional family-based models, where the whole family could be involved, ie. men, women, elders, youth, children and even outside helpers, and underlining that such models are key for maintaining and transferring traditional indigenous knowledge, for utilizing all available food resources and minimize waste, and emphasize that this model must be understood, respected and used as a foundation for the best possible governance decisions. This also includes building bridges between different generations involving children and youth and introducing them to ancestral traditions, values, norms and understanding,

Supporting courses and seminars to achieve the goals of preserving the languages and cultures of the indigenous peoples of the Arctic, bearing in mind that the UN has declared 2019 the year of International indigenous languages, explicitly linking sustainable development to indigenous languages,

Underlining the need for food security for Arctic Indigenous Peoples based on their equitable access to and possibility to select their own resources, food empowerment through utilization of their Traditional Knowledge, sustainable use of all resources in accordance with their traditional food systems, food safety regimes adapted to Arctic realities and Indigenous cultures, focus on health and well-being, and local economic development and value-added from within their own societies,

Noting that our human and natural resources have the capacity to enable Indigenous Peoples to become more food sovereign and food secure, and support development of transformative mechanisms and technology to back up and encourage this,

Underlining that traditional Indigenous food and food products have been produced in a sustainable manner, caring for and relying on the environment, and meeting the criteria of good, clean and fair food, representing real sustainability and original circular economies.

Underline that public awareness raising and education on food sustainability, food waste and selection of local foods in the long run also raise public awareness of other aspects of sustainable development, including climate change, globalisation, environmental, economic and societal issues,

Noting the need for more research, education and monitoring of traditional food availability, access, utilization, sustainability and health for Arctic Indigenous Peoples,

and supporting efforts to establish an international Master's program for Arctic Indigenous youth linked to UArctic EALÁT Institute at Sámi University of Applied Sciences,

Underlining that Arctic food governance, as well as marketing and supply chains, must be adjusted to better accommodate traditional indigenous knowledge, family-based reindeer herding and other traditional indigenous livelihoods, and indigenous peoples' local economies,

Recognizing the need for special efforts to realize that Arctic indigenous peoples and societies are in position and able to utilize arising opportunities from Arctic change, on their own terms, based on their own needs, their own resources, knowledge base and people, so that the opportunities of our changing Arctic can be real opportunities for all, and that no one is left behind,

Underlining that such special efforts today also represent key contributions to the future adaptation and resilience of Arctic Indigenous Peoples, their societies, communities and livelihoods facing profound Arctic change, recognizing that Arctic Indigenous Peoples may not need much, but we need it *more*,

Acknowledging the establishment of the Russian National Centre for Reindeer Herding Development in Yamalo-Nenets Autonomous Region as a capacity building measure for indigenous youth and documentation of food culture.



Photo by Yuri Kokovin

The participating Arctic indigenous youth and project management of SDWG EALLU therefore make the following Recommendations to the Arctic Council:

1. Encourage the Arctic Council through its relevant Working Groups to keep clear focus on Arctic indigenous food cultures and systems, and support activities on Arctic indigenous food systems, youth, food security, nutrition, health, economy and well-being, as a follow up of point # 14 of the Fairbanks Declaration of 2017.
2. Encourage further development of indigenous trans boundary knowledge networks to bridge the gaps between society and academia, between academia and business, and between science and Traditional Knowledge, focusing on Arctic Indigenous peoples food culture, food sovereignty, food security and business development, and invite Arctic Council Members and Observers, including UArctic, IASC and IASSA, to contribute to this in order to contribute towards reaching the UN SDGs.
3. Encourage the establishment of international multidisciplinary programs for educating indigenous youth in food Traditional Knowledge documentation, food entrepreneurship, innovation and circular economy, based on the EALLU project and the Arctic Indigenous Peoples' Culinary Institute, the AFIC project and other relevant work ongoing within the Sustainable Development Working Group, as a follow up of point #14 and # 22 of the Fairbanks Declaration of 2017.
4. Underline the need for adaptation and resilience of Arctic Indigenous Peoples and their traditional livelihoods through documenting and re-coupling Traditional Knowledge on food into Arctic Council activities focused on economic development and governance where relevant, and by lifting the overall awareness of Arctic Indigenous food cultures, systems and knowledge.
5. Support, through the activities of the EALLU project, continued adaptation and resilience building for indigenous peoples by establishment of international exchange programs and projects for indigenous youth through educational opportunities, community-based workshops and seminars focused on food culture and traditional livelihoods, Traditional Knowledge and science, innovation and circular economy, and indigenous language efforts, in order to contribute towards reaching the UN SDGs, leaving no one behind, as well as the aspirations for the UN year of Indigenous languages.

The participating Arctic Indigenous youth of SDWG EALLU therefore also identify the following additional opportunities and options for consideration:

1. Support in general that Permanent Participants themselves and Observers with the support of at least one Arctic State continue to initiate, plan and implement Arctic Council projects of relevance to their local societies in a rapidly changing Arctic, to secure both local engagement and capacity building.
2. Support a separate follow-up EALLU task to further investigate the possibilities for utilization of the Northern Sea Route and new slaughterhouse processing technologies for improving the economic base of Arctic indigenous peoples', in close cooperation with Association of World Reindeer Herders, Permanent Participants and Member States. Sakha Republic (Yakutia) in Russia will function as a pilot region.
3. Support establishment of Arctic standards of indigenous food production, based on food security and safety, but adjusted to Arctic indigenous cultures, food practices and Traditional Knowledge, as well as our Arctic food production realities.
4. Encourage development of a new branding system for Arctic indigenous peoples' products including fair trade, food specialties and circular economy concepts.
5. Acknowledge the importance of the economic freedom and economic basis of Arctic indigenous peoples' traditional livelihoods, and encourage their access to and ownership of the most profitable activities in the value chain.
6. Encourage increasing trade of indigenous foods and products between indigenous peoples' business enterprises and regions in order to stimulate local Arctic development and economic cooperation.
7. Suggest arranging the 1st Arctic Indigenous Peoples' Food Festival in collaboration with the Arctic Indigenous Peoples' Culinary Institute network.
8. Suggest creating a *Nomadic Pop-up Restaurant* for innovatively joining traditional Arctic indigenous food culture with avantgarde Michelin-style cuisine.
9. Suggest establishing scholarships for Arctic indigenous students for writing a thesis or dissertation on traditional food culture, as well as internships with small scale food businesses.
10. Suggest establishing a task for assessing existing public support programs and financial mechanisms for stimulating innovation, entrepreneurship and economic development specifically in indigenous and reindeer herding societies, aiming to improve efficiency of existing measures and suggest new actions.

3. THEMATIC CHAPTERS:

3.1 Transforming our understanding of Arctic Indigenous food

3.1.1. The role of traditional knowledge in indigenous peoples' food systems in the circumpolar north

Prof. PhD Svein D. Mathiesen, Svetlana Avelova, Alena Gerasimova, International Centre for Reindeer Husbandry, Prof. PhD Ludmila Gashilova, and Assoc. Prof. PhD Svetlana Chernyshova

University of the Arctic Institute for Circumpolar Reindeer Husbandry (UEI), UIT The Arctic University of Norway, International Centre for Reindeer Husbandry, (ICR), Sámi University of Applied Science, Kautokeino, Norway and M.K. Ammosov North-Eastern Federal University (NEFU), International UNESCO Chair on Social and Human Adaptation of the Arctic Regions to the Climate Change, Yakutsk, Republic of Sakha Yakutia, Russia and the Institute of the Peoples of the North, Herzen Pedagogical University, St Petersburg, Russia.

Arctic and sub-Arctic environment, climate and biodiversity is changing in ways unprecedented in our long histories in the north, challenging traditional ways of life, wellbeing and food security, constituting a legitimate concern for the future of traditional indigenous livelihoods (Glomsrød *et al.*, 2016; Degteva *et al.*, 2017). Mathiesen *et al.*, (2018) described indigenous reindeer herding adaptation to new hazards in the Arctic as loss of pasture lands exacerbated by a changing climate. It is important to support knowledge-sharing on impacts and adaptation measures connected to climate change and to the loss of grazing land, while also recognizing the value of traditional knowledge as a foundation for adaptation. Indigenous reindeer herders will need immediate adaptive solutions and new societal opportunities which also include reindeer herders' food culture. Recently, Nakashima *et al.*, (2018), discussed the basic concepts and definitions of indigenous knowledge, underlining that the use of indigenous knowledge is a recent development in climate science, in climate assessments and adaptation insights. Many indigenous peoples and marginalized populations live in environments that are highly exposed to climate change impacts as a result of this heightened exposure and their natural resource-based livelihoods, and these societies are already observing and responding to changes exacerbated by climate change. For example, Sámi reindeer herders in Norway already experience increase in spring temperature by about 3 °C. We are worried that indigenous peoples' food culture will be further affected, and therefore we have documented the food systems of multiple indigenous peoples across Russia demonstrating that traditional food production systems are nested within their indigenous cultures. Indigenous peoples' livelihoods such as reindeer husbandry, fishing, hunting and gathering represents ways of life based on practices and knowledge developed through long-term experiences in living under harsh and highly variable conditions across the breadth of Arctic environments from Sakhalin in the Russian far East to Finnmark, Norway in the West.

This chapter of the EALLU 2019 report to the Arctic Council is based on 14 chapters published in Russian language in the scientific journal *Diedut*, nr 1 2018.

The Ottawa principles on traditional/ indigenous knowledge (2014) define traditional knowledge as a systematic way of thinking and knowing that is elaborated and applied to phenomena across biological, physical, cultural and linguistic systems. Traditional knowledge is owned by the holders of that knowledge, often collectively, and is uniquely expressed and transmitted through indigenous languages. It is a body of knowledge generated through cultural practices, lived experiences including extensive and multigenerational observations, lessons and skills. It has been developed and verified over millennia and is still developing in a living process, including knowledge acquired today and in the future, and it is passed on from generation to generation. Recently the Arctic States signed the *Agreement on enhancing international Arctic Scientific cooperation* in Fairbanks May 11, 2017 and the agreement included traditional knowledge as "Scientific Activities". We discuss traditional knowledge as a knowledge base for Arctic Indigenous Peoples' food systems and science. Serotetto and Lublinskaya (2018) compared and discussed the terminology of the slaughtering processes and reindeer by Nenets from Yamal Nenets AO and Sámi in Finnmark Norway. The Sámi and Nenets have different ways of slaughtering reindeer and subsequent cutting of the carcass, different uses of meat, blood and different organs, but which is determined by the way the food is served for human consumption, describing two distinct different food systems. Furthermore, Okotetto and Barmich (2018) described the traditional knowledge about reindeer fat in Nenets reindeer husbandry developed for centuries, preserved in the culture of ethnos, passed on from generation to generation, used in ritual ceremonies and material culture of the Nenets Peoples. Okotetto, (2018) report use of berries and some types of edible herbs playing a special role in the formation of the Nenets diet in Yamal Nenets AO. Traditional knowledge of Nenets Peoples about the culture of nutrition contributes to the preservation of traditions and customs. Such material cultures include taboos in the food culture of reindeer herders. Gerasimova, (2018) indicated that reindeer herding peoples all across the Circumpolar North have a unique traditional system of knowledge about food taboos that have been respected for many centuries. For example, of these, there are food taboos associated with prohibition to eat the tip of a reindeer tongue. For centuries reindeer herding peoples have lived remotely apart from each other, and up until now this almost identical tradition has been preserved and widely dispersed among many northern ethnic groups. Despite the available information in the scientific literature about this food taboo among reindeer herding peoples, there are still no theoretical studies that explain this fact in the traditional culture of indigenous small-numbered peoples of the North. We found that this tradition is mainly related to the ways of socio-normative regulation of the behavior among members of a traditional society, also with their religious beliefs and sanitary-hygienic norms. Indigenous languages are important in the Evenki reindeer peoples' food system, since Evenki terminological units are associated with the food culture, Evenki people's history, culture and ethnography (Avelova, 2018). Dolgan indigenous peoples experiences seasonal changes of traditional food culture (Chuprina and Chernyshova, 2018). Investigation of a number of factors allowed these authors to reveal the interrelation of gastronomic traditions of Dolgan with the traditional culture of their everyday life, to reveal the diet of food in accordance with this or that season of

the year and to show the dynamics of its development. They concluded that diversity, rationality and stable traditions of Dolgan food culture determine the ethno-regional peculiarity, specificity and originality of their ethnic culture. Traditional knowledge of culinary cultures has been accumulated and developed over the centuries and at the present time represents a genetic resource that represents actual and potential value, based on the development of traditional environmental management tools that ensure sustainable existence in the harsh climatic and complex socio-economic conditions of the Arctic (Terletskaia and Chernyshova, 2018). Finally, fish is important for many of the indigenous peoples also reindeer herders, and the cultural identity of ethnic groups like Nivkhs and Selkup indigenous peoples (Gashilova, 2018) (Gashilov and Turks, 2018). These different articles provide insights into indigenous peoples' sustainable use of resources including their use of reindeer, wild animals, berry and fish.

Recently, Johnsen *et. al.*, (2017) found that a Sámi worldview still influences reindeer herders understanding of the relationship between humans, reindeer and nature in Finnmark Norway. Likewise, recent investigations of Russian Indigenous Peoples' food knowledge supports this conclusion. The food production systems of Nenets, Sámi, Dolgan, Selkup, Even, Evenki and Nivkh is diverse and rich, yet these systems face an erosion of the traditional knowledge upon which they are based. For example Sámi reindeer husbandry in Norway find it challenging to determine a sustainable economy based on traditional knowledge and indigenous worldview. Gordon *et. al.*, (2017) concluded that there is a disconnection between people and the biosphere and the capacity to monitor changes that can affect sustainable food production. This is due to asymmetrical feedbacks between producers and consumers, and we now need to rewire the different parts of the food systems and re-connect back to the biosphere through food cultures (2017:13). Likewise, Burgess *et al.*, (2017; 2018) shows the richness and diversity of indigenous food cultures in the Arctic, but called for urgent cooperation to protect this knowledge source in the recommendations to the Arctic Council ministerial meeting 2017.

With these perspectives, we are concerned about the currently limited adaptive capacity of Arctic indigenous communities to preserve their food culture and use their local natural food resources for sustainable development. We propose that reindeer herders' food knowledge is essential to our future ability to adapt to the ongoing climate changes in the Arctic. Arctic indigenous peoples' food systems can be understood as coupled social-ecological systems based on traditional knowledge, but might risk in the close future to be decoupled from nature or even broken down if not fixed. This chapter is a part of the research project «Rapid change - challenges and/or opportunities for sustainable reindeer husbandry? (RIEVDAN)» funded by the Research Council of Norway.

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3.1.2 Gourmand International: Following the example of EALLU, Indigenous youth lead way in times of change

Per-Johan (Pelle) Agorelius, Gourmand Awards

Gourmand Awards is the largest and most international food culture competition in the world. Ceremonies and gala nights were held for the 23rd time on May 24-26, 2018, in Yantai, China. It gathers top chefs, scientists, photographers, designers and drink and food book authors from the whole world to an annual celebration and very friendly competition of finding the very best of food culture. Inspired by the Olympics and its spirit, participants not only make business but they also make friends for life. Exhibitions, lectures, seminars and cooking shows are important keys to the event. And of course, grand dinners. On May 25, 2018, we had 800 guests from 67 countries celebrating the Gourmand Awards by a single long table stretching towards the sea outside Yantai.

Representing Gourmand Awards I have myself had contact with the team behind the food book EALLU since late summer 2017, thanks to Björn Lyrvall, Ambassador of Sweden to the Arctic Council. He connected me with the Association of World Reindeer Herders through their Secretary General and Project Leader Anders Oskal. Subsequently the book EALLU was nominated for the Gourmand Awards 2018 in two categories: *Arctic Cuisine*, and *Best in the World Across All Categories* - the main prize. The book was publicly announced as among the top three contenders of both categories in December 2017.

Later on, Ambassador Lyrvall and Oskal both participated at the Gourmand Awards Swedish press lunch we organized at Örebro Castle in Sweden on March 15, 2018 in close collaboration with Governor Maria Larsson of Örebro. The event, its topics and its talks on Arctic issues and food culture was highlighted both by Swedish public television as well as radio and written media.

Indigenous and local food cultures, culinary history, sustainability and future opportunities and threats have been topics for many national books across the world the last years. What Gourmand Awards have found are that chefs, authors and scientists are increasingly getting together and making significant positive impacts with their cookbooks, their engagement and their work.

At the Gourmand Awards finals in Yantai, China on May 25-26, 2018, a highly appreciated delegation of pan-Arctic indigenous youth presented EALLU, organizing unforgettable demonstrations and tastings, as well as strong media meetings. The Gourmand Awards was also honoured to host the Vice Minister of Regional Government and Modernization of Norway Ms Anne Karin Olli, responsible for high north affairs, who had joined the delegation to China for the occasion and whose ministry co-funded the participation of the Arctic youth. This was also much appreciated as Norway is one of the co-sponsors of the EALLU project in the Arctic Council.

As the time came for the awards ceremonies, there were truly memorable moments as the EALLU youth came on stage twice to receive two first prizes - for the best *Arctic Cuisine*, and the main prize itself - *Best in the World Across All Categories*. (And since the Nobel Prize in Literature unfortunately was cancelled for 2018, I personally need to say that the indigenous youth of the Arctic may have won the largest book prize of all last year - not only for food books)

Why EALLU won:

The jury's justification why EALLU won the Main Prize of the 23rd International Gourmand Awards, by the words of Chairman Edouard Cointreau of the International Jury:

"...EALLU is the first book ever, presenting an overview of the food cultures of the indigenous peoples of the Arctic. A unique book that, unlike many others, can really change the life of indigenous families, their nomadic communities and villages. In an exceptional and impressive way the authors, who are all Arctic indigenous youth, have managed to create a book that share the way of life and the food culture of places that has been known by very few people on the planet. The importance of their work and the beautiful EALLU book has no comparison.

The way these youth professionally and respectfully shared their food, the Arctic culture and their insights on sustainability at the 23rd Gourmand Awards on May 26, 2018 caught the immediate attention of chefs, authors, writers, journalists and photographers from more than 60 countries."

In the competition, known as the "Olympics of food books", the EALLU book and its indigenous youth author team competed with 1 372 pre-qualified entries from over 70 countries of the world.



A main guest at the tastings in the reindeer herders' nomadic tent set up for the occasion was Ms Stephanie Swane, publisher of Modernist Bread (Cooking Lab), USA, who is very well known and respected in the business. Stephanie told us that meeting the indigenous youth behind the EALLU book was her best experience from Gourmand Awards 2018, especially meeting with the participating skillful and powerful young indigenous women.

The unique Arctic cuisine deserve a place among the greats. The food and the cultures so closely knitted to survival in the most harsh places on earth are really exceptional. Knowledge and respect for nature has for more than 10 000 years been the key for human existence there. Short intense summers with an abundance of life, combined with freezing long winters has created unique food cultures that should in our mind be considered as a heritage for all of the world. The whole world knows so much about Japanese food, French cuisine, Mediterranean diets and so on, but the treasure of indigenous foods of the Arctic holds so many keys to the future.

Since the book EALLU casted the light on the foods from the very north, the Gourmand Awards now has established a separate category for Arctic, on the same international level as other more well-known cuisines. This decision was not in any way made by coincidence, as the Arctic represents the frontlines of climate change for the whole planet, and a region that in many ways has been overlooked until very recently. And as pointed out, the food cultures of Arctic indigenous peoples likely represent the least explored and least understood parts of world cuisine today.

The Arctic and EALLU lead way on climate change topics and the role that food books can have on the matter. Inspired by this, Gourmand Awards have now started a series of events themed *"Cookbooks and Climate Change"*, initiated by the French Ambassador to Sweden David Cvach and the Gourmand Awards by Pelle Agorelius. The first event was hosted by Ambassador Cvach and Pelle Agorelius of Gourmand Awards at the French Ambassador's Residence in Stockholm on December 18, 2018. Here EALLU gave a key note speech by Anders Oskal supported by young reindeer herders Per Jonas Partapuoli from Sweden and Rosa-Mären Magga from Finland. Present were Arctic Ambassador Björn Lyrvall, Ambassador of Finland to Sweden Liisa Maria Talonpoika, Ambassador of Canada to Sweden Heather Grant, Secretary General of UNESCO in Sweden Mats Djurberg, along with authors, chefs, publishers, journalists and cultural editors.

After the Stockholm event, Ambassador David Cvach concluded:

"...The indigenous peoples of the Arctic have been on the back side of history for too long, but now it turns out they can lead the way for the rest of the world in times of climate change, as they are actually ahead of us all when it comes to sustainability. They can teach us to become more respectful of nature and of each other, which is now the condition for the survival of humanity, just as it has always been the condition for their own survival in the Arctic."

Arctic indigenous youth lead the way. Through the Gourmand Awards, and by following the example of EALLU, we meet; We meet people we would not have met anywhere else, we learn things the world needs to know, we grow knowledge and insights.

Food books like EALLU takes us places few have ever travelled, and even fewer have learnt from. EALLU has brought the world closer to the Arctic, its food and its history, and has brought the Arctic closer to the rest of the world. And the indigenous youth themselves show us their way into the future. Research and reports from those who live on the tundra, in the mountains and in the forests cast the Arctic in a completely new light. Food create not only pride and action, it also unifies peoples and countries in times of change. Our time in history is a time of climate change, a time of globalization, and a time when international unity has never been needed more. The EALLU project, the participating indigenous youth, and their remarkable and groundbreaking work has made us all stop to think for a moment.

Finally, I hereby refer the following statement from Edouard Cointreau, Founder and President of the Gourmand Awards, as well as Chairman of our international jury:

“...The most recent categories in the Gourmand Awards are Caribbean, South Pacific and Arctic. The concepts of their Food Cultures are today generally very similar, which seemed impossible one century ago. In the past 75 years, Western foods have variably replaced traditional foods in those three areas. The consequences have been devastating for health, sustainability and culture. Now accelerating climate change is threatening the survival of these populations, and of some of their countries.

...In 2010 when we gave the Best in the World Award Across All Categories to the book “Me'a Kai”, by chef Robert Oliver (Penguin Books New Zealand), it started a Food Culture revolution in the South Pacific Islands. There were television series, more books, and action by governments. The award restored the pride to local groups who realized the key value for the future of their traditional foods and cuisines, and took decisive action. I hope that the book EALLU can have the same impact on the Arctic.”

Edouard Cointreau, Gourmand Awards.



Photo by Association of World Reindeer Herders/International Centre for Reindeer Husbandry

3.2. Food culture

3.2.1 Sámi *herskkot* – Sámi tapas

Inger Anita Smuk, Chair of the Board, International Centre for Reindeer Husbandry

Chins, eyes, brain mass, kidney, liver, blood, intestines, abdomen, tallow, fat, marrows and hooves are known as being a delicate meal for Sámi reindeer herders. With this, one can create countless dishes that are put together to lots of delicacies. These are raw materials made by simple cooking, only needs to be added salt. But with more cooking, and by adding other ingredients, one can get other consistencies and flavors. Research, by the way, shows that one gets most of the nutrients that the human body may need from vitamins, minerals, proteins, etc., by using reindeer as main food in their diet. But then it is important to have knowledge how to handle this.

For example, by boiling the different parts of the reindeer that I have described, one gets many different broths, that one can for example drink directly, use as broth in soups and sauces and use as liquor when making bread. Bouillon is the best to use when boiling blood, for example, as *gumppos*, “small blood cakes” and *márfi*, sausage. Even blood can be mixed in the broth having a result as a tasty soup. In addition, fresh blood can be drunk when slaughtering a reindeer. This tradition I have not grown up with and one reason may be that the killing method has changed since my parents grew up. In my own estimation, I found that with one liter of blood you can make blood food, such as sausages and *gumposat* and feed 15 persons!

Reindeer’s marrow bones are so diverse: The marrow of *čuožžalmas*, the bone in lower hind leg and *vuorgu*, the bone at the bottom line of a reindeer is the real marrow for us. The marrow can be eaten raw, frozen, or just heated for a few minutes and then chopped and eaten directly. If these bones are cooked too long time, one has totally reduced the marrow and it is considered inedible. The bones are very hard and can be used to make for example bone jewelries, needle housing, instruments, etc.

Other marrow bones are excellent to chop for cooking. One gets a tasty broth, and in addition, one can eat the marrow and of course, fret the meat on the bone. My mother always said that the best meat is closest to the bone and that is true; just taste. Another thing she said was that it is important to eat all bones clean for meat so that female reindeer gets happy and licks her calves well. You can separate the fat oil from the broth and use it as a dip when eating meat, fish and bread.

Boiled hooves from adult reindeer are also considered as a delicacy. Although it takes 5-6 hours to cook them, it is absolutely not in vain. The bouillon of this is also unique, and can even be used for preparation of the fur for clothing. This broth has an oil that only solidifies when it gets cold. When brought to room temperature, it becomes liquid.

Oaivemális, soup of boiled reindeer head, is for me one of the best parts one can eat from a reindeer. The head is skinned and the skin is taken care of in order to make

with shoes. The chins are loosened and can be boiled. Antlers are chopped off and is sought after material for craftsmen. The brain mass can be taken care of and used in for example, making bread. The head is chopped and cooked for 4-5 hours. Traditionally, one eats the eye and the ear parts on a chopped head, and then it should only be skull left. An important ritual of such a meal is to break the eye cavity in the skull to prevent accidents. "*Nu ahte guoržžu ii guovlla*" (translation: "so that something that brings accidents does not look through")

Kidney and liver can be eaten raw, cooked or fried. I prefer them as a paste or liver/kidney cakes mixed with tallow and fat from reindeer.

To prepare these raw materials from choosing of which animal to slaughter, to killing of the reindeer, to skinning the reindeer to they are ready for cooking, is a long process. I am taught that adult animals are used for food which again gives the best economy. This way you can use the whole animal. Not only as a food but the skin and fur are used for clothing and bones are used for equipment and tools that are especially dedicated to the Arctic climate. If you manage to use each reindeer correctly, then there will be left with only the rumen content as waste, which in turn is a resource for the nature where it is left.

Today, this is still valuable food in Sámi reindeer herders' diet. But availability is very limited. Since the reindeer is mainly slaughtered industrially, the focus is only on reindeer meat. As a result, the parts of reindeer that I have described are impaired and unfortunately treated as waste of, if not used as a raw material in the production of dog food, for example, for dogs used in tourism and in dog races through reindeer herding areas, and thus creating major challenges for reindeer husbandry.

3.2.2 Evenki tradition of milking reindeer

Nadezhda Gerasimova, Evenki family cooperative "Oldoyo"

The Evenki people use fresh reindeer milk - *oronni ukumni* to make whipped or sour cream to eat with tea. Reindeer milk can also be used to make butter, cottage cheese, cheese and other dairy products. The milking season starts during the second month of lactation and it is performed once per day. Reindeer milk is different from that of other food-producing animals, as it is higher in nutrients. Compared to cow milk, it contains 5.8 times more fat, 3.1 times more protein and 2 times more mineral salt. Nutritionally, reindeer milk is 3.8 times more superior than that of cows. Reindeer milk has 4 times more calories, meaning 1 kg of reindeer milk has 2-2.5 thousand calories.

Female reindeer begin to produce milk after the birth of a calf. Reindeer pregnancy lasts for 7.5 or 8 months. Before calving starts, herders separate the females from the main herd. Calves began to appear in May, though the most impatient ones are born in April. Those Evenki who have witnessed the mystery of reindeer birth know how touching this natural phenomenon is. Calves are born directly on the snow. The mother-reindeer licks her baby, and the calf is barely clean but it already tries to get up on its unstable legs. The herders are on duty guarding the reindeer 24 hours in a row on shifts. There are times when a herder needs to help the reindeer give birth, particularly when it is the reindeer's first labor.

Summer vacation is the best time to be in the taiga. It means taking care of reindeer calves and engaging in activities related to the calves, of which there are many. First of all, it is about getting to know the new members of the herd. When the whole herd comes out of the woods and goes to the *kure* (reindeer fence), everyone, young and old, looks on to see what handsome newborn calves are following their mothers. The herders try to remember each new calf, and they emotionally and admiringly discuss on every each one. Then everyone begins to earmark the calves they own. For this purpose families prepare their own family *sekan* – an earring made of cloth of a certain color and ornamentation. The earring is attached to the calf's ear with a needle.

After 1.5 months, when the calves are bigger, the season of reindeer milking begins, and along with it, the calves are tamed and taught to be tied up. The purpose of tying them up is, first of all, so that the calves don't drink too much milk before the milking session, and second of all, so that they get to know what an *uhee* (bridle) is, in other words, it is the transition from wild to domesticated.

The same is practiced today as it was in older times. The herders allow the reindeer to calm down after they enter the *kure*, and then they start to catch the female reindeer and calves. The calves are just like children – some of them are calm and quiet, some are like hooligans. Well, there aren't many of them, but there are at least a couple of calf-hooligans in each herd. In the beginning, the calves behave anxiously: kicking and trying to get out of their bridles. In general, the little calves become resigned to the fact that they are tied up and then they rest peacefully. But there were always calves that resisted and ended up torturing themselves throughout the day. These "troublemakers" needed

to be constantly looked after. Herders are particularly watching over these calves, since they could entangle themselves in the bridle and suffocate.

Milking started at 5-6 p.m. It was possible to milk about 200 or 250 ml of milk from 12-15 female reindeer. To milk the reindeer, the women usually had an assistant, a son or daughter, to tie the reindeer to a tree and hold it while the woman was milking. Afterwards, the calf is released from the bridle and immediately runs to its mother to drink the milk that would always be saved for it. When first milking for the season, there are times when herders don't know which calf belongs to which reindeer. In this case, they lower the bridle and let the mother-reindeer approach her calf herself. This is also a way to learn which reindeer is whose. After feeding the calf, the reindeer run to the river to drink water and eat fresh grass. But the calf doesn't run to the river with its mother, because the calf knows that soon another female-reindeer will feed its own and so it waits. While the reindeer is feeding its calf, the "hooligan" joins in to drink more milk.

The collected milk is filtered through cheesecloth and bottled. One liter of milk is usually set aside for boiling. The bottled milk is kept in a cool place. Usually the reindeer herders dig a hole in the ground to keep perishables like milk fresh. The milk can only be used the following day after it was collected.



Photo by Lyubov Sidorova

References: Gerasimova, Nadezhda, 2017: The Traditional Cuisine of the Evenki People of Southern Yakutia, p.104-106

3.2.3 Food for big events, Sámi style

Elna Sara, International Centre for Reindeer Husbandry

Sámi people regard a wedding as a big event, where the number of guests can range from a few hundred to nearly two thousand. It is a tradition to invite the whole family, both adults and children, and it is also a tradition to invite widely of the clan, as well as good friends. In the past, it was important that children also participated in the wedding as it was considered to be a blessing for the married couple.

Planning of a wedding starts well in advance of the event itself, and both the bride and groom's families contribute in the preparation and execution of the wedding. New traditional clothes from top to toe are made for both the couple to get married and to their family members. This work is usually done by the women in both families.

When cooking food for many people, there are some questions to be considered: What food is tasty and easy to cook, what kind of food is available to as many as possible, what raw materials and ingredients are needed and what can be provided from own reindeer herd. Relatives and friends who have organized weddings earlier are often asked for advises on the amount of food that has to be made, which and how much raw materials and ingredients must be provided or purchased and how to solve other practical aspects of the event. In that way, a wedding is not just an arrangement for two families, but also involves a broader part of the family, as well as close friends of the bride and groom.

In relation to the food to be served, preparations start well in advance. Berries are picked in the berry season the fall before the wedding itself, and it is picked in larger quantities than usual. If planning to serve smoked reindeer meat, this will be done in advance, in a traditional way in a traditional *lávvu*.

For the Sámis it is very important that all guests get food and do not leave the table hungry, as it is considered as shameful, and the couple and their families can be considered to be stingy if there is not enough food for all guests. Thus, food is made in large quantities to make sure that it is enough to everyone, plus a little bit more, and in addition have a reserve and a plan B in the back of the hand in case more something would go wrong.

The traditional “*bidus*” has become the dish served at weddings and at large events. It is

a kind of meat soup with few ingredients. It is easy to make in large quantities and tastes good. *Bidus* contains two main ingredients; reindeer meat and potato, and can be made in several ways. Almost every Sámi family has its own *bidus* recipe; some use little potato in the dish, while others also use carrots and, or onion. It is also common to have some chopped *goastebuoidi*, which is dried, rancid fat.

The reindeer slaughtered for food are always slaughtered when the moon is growing. The families themselves decide which animals and how many animals to slaughter to be sure to have enough meat for the wedding. For *bidus* served at weddings, the meat from the steak and shoulder are used as these parts have most meat compared with other parts. Traditionally, *bidus* is also made from “*gurti*”, the meat from the neck, and the heart of reindeer are also used to make *bidus*.

When the wedding day is getting closer, family members and close friends are invited to contribute to practical tasks such as cutting the reindeer meat into small parts, peeling and cutting potatoes and carrots, onions in smaller parts. This is usually done the day before the wedding. *Bidus* is cooked the same day as the event and boiled in several large saucepans of 30-40 liters. Together with the meat, bones are cooked from where the meat is cut off, giving a very nice taste and consistency of the food. Potatoes are put into the pot at the end of the cooking, but can also be cooked separately and placed in *bidus* before serving.

Usually older aunts and female relatives of the bride couple are those who stand for the cooking of the main course with assistance from younger women. In this way, knowledge on how to make *bidus* is transferred between generations.

To *bidus* is served in addition home baked bread, mostly baked with wheat flour. Also, the bread can vary from family to family; some have rosin in the bread while others do not. The bread is sliced and lubricated with butter. This work is done the day before wedding itself as there are large quantities of bread to be prepared. This is also traditionally something that women do. Juices with different flavors are served as drinks for the food.

The most usual dessert served in weddings is whipped cream with cloudbberries or other berries. After dinner, coffee and cakes of various kinds are served, baked by family members and friends.

“Night food” is served around midnight. The night food can be different cold dishes, like fish, smoked reindeer meat, various salads, boiled sliced reindeer tongue, sliced meat from other animals, salmon, dried reindeer meat/reindeer hearts and more. Another dish that is often used as night food is sautéed reindeer meat, potatoes and cranberries. This is a dish that is easy to make and can be made as guests are serving themselves.

Slaughtering the reindeer that are used and to cut the reindeer carcasses in smaller parts is often the work of men, while the cutting the reindeer meat for both *bidus* and night food is performed by both men and women.

It is very common that Sámi weddings last for 2 days. Traditionally cooked boiled meat is usually served the second day. In addition, boiled reindeer tongues and marrow bones are served. In some weddings, also “blood cakes”, *gumpposat/guhpárat* are served. If there is leftover of *biđus* from the day before, this will also be served the second day.

As dessert is served whipped cream with cloudberry or other berries, or homemade compote of prunes. Dinner ends with coffee and cakes of various kinds, also leftovers from the day before.

Serving of food in a Sámi wedding takes many hours both days. There are no buildings or facilities with as many seats as there are guests at Sámi weddings. This is solved by the guests arriving at the wedding at different times. The closest family are usually the first to be served, and they might have already having coffee and cakes when the last guests arrives. Therefore, the dinner is served for several hours to be sure that all arriving guests have had dinner. The preparation and making of night food start before the last guests are having coffee and cakes.

Preparing and organizing a Sámi wedding requires many persons to different tasks. This is solved by asking for voluntary help from relatives and friends, and it is very rare that someone refuses to contribute. Advices and knowledge are shared between those helping, and thus the wedding becomes an event that connects two families together, an event where relatives meet and strangers get to know each other.

3.2.4 Insight in meat quality through indigenous reindeer herders' traditional knowledge

Ravdna B. M. Eira Sara, PhD student, Sámi University of Applied Sciences and UiT - Arctic University of Norway.

What is meat quality from an indigenous reindeer herder's perspective and how does he or she measure reindeer meat quality?

Knowledge about the slaughtering processes of reindeer are rich in indigenous reindeer herding peoples' cultures in the North (Burgess et al., 2017). Sámi reindeer herder's understanding of quality of food is based on their traditional knowledge transferred from generation to generation. From a Sámi perspective, reindeer herders focus on meat quality throughout the whole slaughtering process. Traditional slaughtering of reindeer holds different processes that imply meat quality before, during and after slaughtering. Traditionally reindeer herder follows certain customs that matter during slaughtering, as growing moon, killing method, season, pastures and what type of reindeer is slaughtered. Firstly, the slaughtering takes place nearby the reindeer herd when it is the right season for slaughtering. Reindeer herder selects an animal in the herd to be slaughtered according to specific criteria that depends on age, shape and condition and what type of food is planned to be made. The animal is slaughtered with traditional methods and processes which have not been scientifically documented. The slaughtering method is common in all Sámi region but with some variations. These methods have been used and passed over to the younger generations for a long time. So far we are not aware of any scientific articles where indigenous reindeer herder's traditional knowledge is used in planning, experimental design, or scientific analyses of reindeer meat quality.

All these processes and products have a word or concept, therefore naming is important. A reindeer herder expresses everything he or she do through the Sámi language and the concepts contain knowledge. The knowledge embedded in the concepts used during the slaughtering explain the slaughtering process, names of different butchering methods and meat and other parts of the reindeer.

Meat quality address how attractive the meat is as food for humans. The scientific definition of quality covers everything from food safety, ethics, animal welfare, durability, consistency, and smell, color of meat and fat content and slaughtering

processes (Langaker, 2010). Consumers associate quality of meat with attributes as tenderness, safety, water-holding capacity, and flavor and meat color (Wiklund, Farouk, & Finstad, 2014). Even a special classification system in Europe has been developed, the EUROP classification system that gives information about the carcasses content of meat, fat and bones. (Langaker, 2010). For instance, the indigenous way of measuring quality is quite different to the western system, it is much more detailed. Sámi reindeer herders build resilience through two ways of knowing about snow by using components both from indigenous and scientific perspectives, as in Eira's snow study (Eira et al., 2013). In the Rievdan research project, we investigate meat quality through the similar approach. The picture below shows the Norwegian (or industrial) and Sámi way of butchering a reindeer. The industrial way of butchering only use some pieces of the reindeer as food while the Sámi way use the whole reindeer (meat, intestines & other parts) as food and resource in a sustainable way.

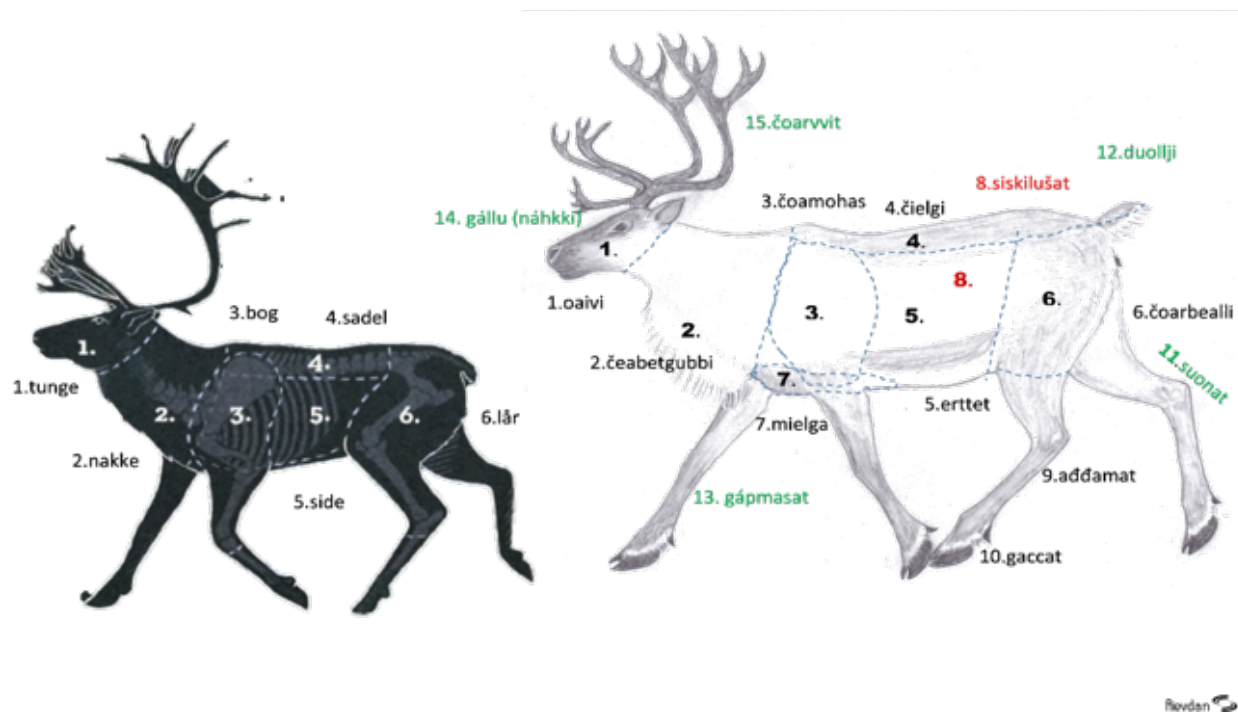


Photo illustration by Aslak Ante Sara, Ravdna Eira Sara & Inger MG Eira & www.matprat.no, 2018

Reindeer herders use more than ten different concepts for fat content when assessing the carcass after slaughtering. For example, *čáhceváibbat* is very poor quality and this meat is not for human consumption. Furthermore, *váibbat* is also poor quality. The use of concepts as *ada* and *addamiin* refers to better quality while from *jolli*, *suorbmajoliin* (one finger), *guovttisuorpmas* (two fingers), *golmmasuorpmas* (three fingers), *njealjisuorpmas* (four fingers) and *ceakkobealgi* (all four fingers plus the thumb up) are from good to very good quality and the thickness of fatlayer is explained by measuring with fingers, that is also quality indicator. Likewise, indigenous reindeer herders in Northern Russia have developed similar types of indigenous concepts of meat quality.

For Nenets reindeer herders fat is an important quality factor, as for Sámi reindeer herders. The season and pastures influences the meat and fat quality of reindeer that are the main quality factors for good meat quality. (Okotetto & Barmich, 2018).

Sámi reindeer husbandry in Finland, Norway and Sweden represents a livelihood and way of life based on practices and knowledge developed through long - term experiences in living in highly variable conditions. Various aspects of adaptation in reindeer herding are reflected in a rich vocabulary of Sámi terms and concepts. Reindeer herders' indigenous traditional knowledge, culture, and language provide a central foundation for rebuilding resilience locally, to be used to navigate through future shocks and disturbances. Institutional governance inevitably also affects reindeer herding cultures and traditional knowledge. (I. M. G. Eira, 2012; R. B. M. Eira, 2012; Turi, 2008) Arctic indigenous peoples are experiencing unprecedented challenges and threats to climate change, land degradation and low sustainability. Projected global socio-economic changes, combined with climate change of as much as +7 Celsius mean temperature increase by 2050 (Magga, Mathiesen, Corell, Oskal, & al., 2011).

Therefore, our hypothesis is that reindeer herders have an indigenous knowledge in food systems. It is developed through generations, by observing and monitoring food from the choice of resource through processing, preservation and food preparation in a sustainable way. This indigenous knowledge has to be documented before it is lost

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3.2.5 Preservation of food and reindeer herding cultures

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Reindeer herding and hunting peoples live in remote places around the Arctic with annually access to food, thus preservation by conservation is important. Conservation is defined as “a complex of different techniques, all aiming at preparing food in such a way that, when stored, it will not decompose to become a health hazard” (Riddervold & Ropeid, 1988) (pp. 211). For nomadic people, such as reindeer herders, conservation of food is important because it eases storage and transport (Murud, in press). Conserved food last longer and are lower in weight, something nomadic people of the Arctic have taken advantage off for centuries.

Scientist have shown that this weight reduction as increasing dry matter content, which was $25.87\% \pm 0.62$ (average SD) for fresh meat reindeer meat in relation to $33.77\% \pm 1.39$ for smoked meat and $66.25\% \pm 1.61$ for dried meat (Sampels, Pickova, & Wiklund, 2004). Furthermore, according to scientists, the smoke protects the meat against degradation by killing or inhibiting growth of the microorganisms (Riddervold, 1978).

An example of preservation technique is smoking. Since smoke primarily affects the surface of the meat, smoking is often combined with drying and salting to protect meat from degradation (Riddervold, 1978). But salt, which also helps dry the meat, was not easy to obtain in the past for the reindeer nomads, thus it was less used (Ryd, 2005). Also, the Swedish Sami parliament states that Sami traditionally used very little salt. Only for winter or autumn slaughtering, the meat was salted and smoked to increase preservation (Sametinget, 2010) (p. 9). When used, meat could be stored in barrels in cold water for several months, after slaughtering in December. According to the Sami people of Northern Sweden, the meat was wind-dried in spring when it repeatedly thaws and freeze. Additional smoking performs in the reindeer herders' tent when humid weather, would increase the conservation time (Harnesk & Brandon-Cox, 2014).

Other Arctic indigenous peoples' food culture was investigating though elder literature by Eidlitz (1969). She states, that freezing and drying was the most important method of preservation (Eidlitz, 1969) p. 173. For instance, smoking of meat were performed by Eskimos in Greenland and on the Barren Grounds (Labrador, Mackenzie and Chugach, Western Lapps in Västerbotten Sweden and in Finland, the native American indigenous groups of Eyaks [in Alaska]. In Eurasia meat-smoking was further performed by Itel' mens, Yukagirs, Evenks, Chuckchi, Negidals, Kets, Nentsy and Nganasans, Altays and the voguls [today known as the Mansi people] (Eidlitz, 1969).

Hansen and Mathiesen (in preparation) show that smoking reindeer meat is often done in the nomadic tents. Thus the meat is to be brought along in backpacks and to be eaten when working with for example the reindeer fences, as given in for example Joks (2007) p. 56. According to Gjernes (2008) s. 512, conserved reindeer meat is still to be brought along today as it gives energy and contribute to tolerance for cold weather. This also, because it is a referred taste in the Sami households, as given in Burgess et al (2018). Thus, as shown here reindeer peoples preserved food is an important part of reindeer people's culture, and preserving this food tradition is part of preserving their culture.

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3.3 Food knowledge systems and practices

3.3.1. The fire

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Fire is a familiar and necessary tool for almost all Sámi. Many have grown up with fire and learned how to make fire from childhood. Both living outdoor in the field and in house, the fire has been a natural and everyday requirement, and it has always had a central position in peoples' homes, be it in a tent or in a house. Sámi people have been living in different areas and terrains, and usually, at least in ancient times, not all Sámi lived and managed in all kind of terrains. Some lived in tundra and in birch forests while others lived at the coastal areas or in pine and spruce forests. You might say that the need to manage have taught us to make use of the nature, and to use fire is one way that surely has risen from that. To make fire one has used the firewood found at the different living places. Thus, you had to learn many things connected to making fire. All knowledge connected to making fire, such as weather, terrain, firewood, fireplace, goahti/lávvu (Sámi tent), affected the result of making fire, and in this way, all these parts are closely connected to each other. In regard to terrain and weather, you had to know where you should put up your tent, how to make fire if you do not have any kind of shelter, see what kind of firewood to find in the area where you want to stay, and what is most suitable firewood for the different needed fires. In addition, there is special knowledge on how the goahti/lávvu will function as a living place and fireplace under different weather conditions.

Most people know the practical benefit of fire, namely the heat. It is also familiar as a tool for making food, and is used as a tool for making food even today. Different characteristics of firewood and use of it might not be just as familiar for everyone. In previous times, people knew to choose firewood for different needs as to make food making fire and other needs, and knew how to make fire and smoke in different situations. Different woods and plants used for smoking meat and fish made differences what comes to taste and color. In general, cold fire and smoke is good for smoking meat and fish, and the fire must not flame up excessively. You should then choose firewood accordingly to that, like wet birch, rotten wooden log or decayed aspen. It is usual in some areas to dry meat after having it smoked, and then you know you need dried wood in the fire, as dry birch. Coniferous trees affect the taste of food smoked with this kind of firewood. Somebody likes to smoke meat with juniper as it gives special taste to the meat. Others do not like to have this wood in the fire as long as the meat is hanging up for smoking. While smoking the meat juniper is used to preserve meat, also dry pine is used. They say that dry pine do not give good taste but is good for transporting food or

preserve the meat in warmer weather, because it prevents insects to get into the meat. This smoke also prevents the meat to get moldy. In the times of wolves, they also took care of reindeer meat killed by wolves. Such meat has bad taste but when smoking the meat with wet willow or juniper, the taste in the meat decreases. Smoke from juniper is also used to remove taste from meat that has taste of rut. To make bread and fry food on hot coals, they firstly choose dwarf birch as firewood, as it gives hot fire. Some choose firstly dwarf birch with leaves because of the taste from the smoke to the bread. Other species of wood work also good to make bread on hot coals, such as clean burning fire of dry birch or dry rowan, which does not cover the food with soot.

The Sámi have also used the smoke and the light from fire in different ways. It is good to know if it is dark, that dry pine gives good light, also other dry wood, if pine is not available. It is good to make smoke at the resting place for reindeer when milking the fertile female reindeer, or at the grazing areas for cows, because insects will not disturb so intensely. They knew which wood or plants to use to make thick smoke and both the reindeer and cows were trained to stay in the smoke.

The position of the fire has often been in the middle and in many ways in the center. Both, the place itself where the fire is, but also in the everyday activities and minds, the fire was a central issue. Ancient Sámi had one goddess who stayed under the fireplace, namely *Sáráhkká*. *Sáráhkká* was the ruler of the tent, and you had to offer her food and drink every day. Based on fire, making fire, fireplace and issues regarded, many "rules" and sayings have been made. Among others, the Sámi have used "rules" and sayings as part in uprising children or in situations when you will not say something directly. An example is the saying "You will put yourself into the fire" if someone seems going or freely enter into troubles. The fire is a conveniently theme to make sayings as the characteristics of the fire is familiar even for the children.

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3.3.2. Perngarneq – the first catch – becoming a man in Greenland

Natuk Lund Olsen, Ilisimatusarfik & Greenland Climate Research Centre

A hunter in Greenlandic is called *piniartoq*, which literally means “one who wants”.^[1] The definition of a hunter today is different than 50 years ago, but yet it is still a male dominant domestic. Today the society is divided into occupational and leisure hunters to catch a specific animal makes a man becoming a man. In Qaanaaq when you catch your first walrus, you become a man. In other areas it is to catch a seal, musk-oxen or a seal. Having kids, getting married or somehow providing a family doesn’t make you a man, what you catch does.

20-30 years ago *perngarneq*, the first catch, was dedicated the boys and men in the societies. Today they are indeed also ritualized towards girls and women. When I was around 5 years old, I collected my first dovekie egg. It was celebrated when I arrived to the hunting location and I had to tell my family and others there about how I collected it and how I had broken several eggs before I had luck, because my fingers were not naturally fine and slim. The oldest hunter in the location at that time gave me 50 kroners, which was a lot of money. My first guillemot, hare and my first caribou were also celebrated, but it was never as big as when my brother caught his first seal; I don’t know if it had something to do with he was a boy.

When my brother caught his first seal he was 11 and I was the one managing the boat, while our father was reading the newspaper in the cabin. When we arrived to the summer camp, Qorngoq, those staying there, came and celebrated the feast with us and when we told and still today talk about that hunting trip, we always point out our father did not participate. When my brother had his first seal, our mother didn’t roll around or dance, but in some families they still act that way. And often the celebration contains *pagga*, which is to literally throw around with money, grocery things or even polar bear skin or narwhal tooth that people can just take.

•Perngarneq with caribous

When Klaus caught his first caribou almost 30 years ago

Klaus caught his first caribou the same year as he got his first rifle. Thirty years ago many sons of leisure hunters got their first rifle when they turned 10, whereas today boys are closer to be 12 of age before they get their own, maybe this has something to do with that today there is access to get a hunting license by the age of 12. To come back to Klaus, when he was 10 and just had his first rifle, he went on his first caribou hunting trip with his father and grandfather. The adults didn’t walk slower because he was with he just had to follow their pace. They walked for many hours before they got close to the animals and he remembers that they walked very fast and he could barely follow them. When they saw the animals, his grandfather helped him to get closer and when he caught it, he had to slaughter the caribou by himself. Afterwards, he had to carry his catch all the way down to the boat. He remembers how he cried, because it was heavy and he was tired. ^[2] In that way he already learned what and how he was going to go

hunting in the future. It was his first test of manhood. And it also taught him what all hunters learn, to only catch what you can carry.

Miilu's first catch

Miilu is an 11-year old boy, who caught his first caribou in autumn 2016. I joined when his parents invited to celebrate the meat. The family who came, all had a gift with to Miilu. He was very happy and his proudness was so strong you could almost smell it and it was as if he had grown somehow, as if he had reached a new stage in his life. The meat of the caribou was made into four various dishes. There was caribou soup with rice pudding, roast, meat with rice and dried. We all sat and ate it and enjoyed the meat a bit extra than normal, because it was shot by one who had killed for the first time. It was as if the taste of the meat changed, because it was first catch meat.

While we all sat there Miilu told how the hunting went. Actually he had to tell it every time some of us asked how it went and he would tell: *We sailed to Tasiusarsuaq with ataata (father) and aataa (grandfather) and afterwards we sailed thru three lakes with the dinky boats and we were a bit excited if we could reach to the tenting area before darkness came. Next morning we started walking but we didn't see any animals. We walked for a long time, but there was nothing. So we went back to the tent and aataa started to make coffee. When my ataata went out from the tent to get some coffee, he suddenly said: "there is a little caribou!" And I said: "I want to shoot it!" Then we quickly started walking up the mountain, but we couldn't get closer and it was a big too far to shoot. But then I shot anyway, from over 400 meters distance, and the bullet when thru two ankles, but it didn't die, so I tried to shoot it again and this time I shot in on the antlers, but third time, I shot it right in the heart!* [3]. All this happened while aataa was drinking coffee and observing from distance. Afterwards they all slaughtered the game and Miilu helped with all that and he carried the legs all the way to the boat and home to Nuuk.

During the night the elders kept saying to Miilu: "now you are a provider, now we are not concerned for getting old, you will provide us" (the two aanaa, grandmothers).

At some point Miilu said to the grandmother, who always makes the roast for his birthday kaffemik: "When I turn 12, I want you to make a roast with my meat!" and the grandmother replied, that she would gladly make it for him.

Before I left the festivity Miilu printed out several pictures of him and his catch, which I see as a sign of he was very proud and he knew it was a big step to catch a caribou. Afterwards his female cousin who is one year younger, kept saying that she also wanted to catch a caribou.

Afterwards, Miilus way of talking about hunting, the environment and the animals completely changed. Suddenly he could give his opinion of how the hunting went, why it went bad or good, what mistakes he did and others as well. Suddenly the environment didn't seem like a playground anymore, it was a place to go hunting. The animals were targets, but had to be shot respectfully and not just for fun. His first catch made him into a wiser boy. His vocabulary within hunting increased tremendously. Two weeks later, he went hunting with his uncle and they didn't catch anything. Afterwards Miilus

conclusion was that his uncle was too inexperienced within hunting and didn't know what he was doing. And he rather wanted to go hunting with his father and grandfather again. Few weeks later he caught his first polar hare, but it didn't end up with a party like with the caribou. Both the arctic hare and the caribou were served on his 12th birthday and again, we got the stories of how he caught them.

This is a modernized ritual of a first catch. The mother didn't act by rolling around and making fun of herself, but I know in some families they still do. Those eating the meat wasn't the whole community, it was the closest relatives. But the boy still told his version of the trip and how he shot it and slaughtered it and everybody are still very proud and he is still seen as one who have become a provider. The fact that his female cousin also wanted to go caribou hunting and experience what Miilu did, tells that the 11-year old girl doesn't consider going hunting and shooting as only for boys and men. This must be a sign of that the gender division has been dissolved.

A woman catching her first caribou

A friend of mine, caught her first caribou in an age of 36. That evening, her family brought champagne and their finest crystal glasses to the harbor so we could toast her success at becoming a caribou hunter. The evening ended up with becoming a feast, where many people gathered to eat the caribou and hear the hunting in detail. I specifically remember how the women in the family pointed that she didn't need any man to provide her with meat.

[1]Nuttall, 2000, 36

[2]Klaus, Nuuk

[3]I have the permission from Miilu and his parents to tell his hunting story.

3.3.3. About food taboos in the Arctic indigenous food culture

Alena Gerasimova, International Centre for Reindeer Husbandry

Food taboos are a special part of traditional food culture, it is codified prohibitions and a systematic set of rules according to which food products or their combinations should not be consumed. The origins of food taboos are diverse: on the one hand, they have a purely religious-mythological basis, i.e. come from religious beliefs, resulting in the division of food into clean and impure, on the other hand, there are also socio-cultural and economic factors that also determine the diet.

Indigenous peoples of the Arctic have food regulations and taboos which dictate the consumption of certain products for different categories of people, depending on their age or gender. For example, today most reindeer herding peoples and hunters of the Arctic and Siberia have a strong taboo related to consuming the tip of the reindeer tongue. Reindeer tongue is one of the most favorite delicacies among indigenous peoples of the Circumpolar North and beyond, and before eating the tongue one should cut off the tip, which is usually not more than 1 cm wide (the size of the tip can be different in a particular region), most often explaining that if one shall eat the tip of the tongue, then this person will develop negative character traits such as excessive talkativeness, deceit, grumbling, etc. The tip of the tongue itself is usually taken to be thrown into the fire, either given to dogs or left in a sacred place. During our research we found that the majority of reindeer herding peoples living in the North, Siberia and the Arctic do not eat the tip of reindeer tongue, which becomes a common feature of world reindeer herders' ethnic cuisine. We also found that most of the explanations of the tip of the tongue taboo act as a normative behavior regulation of the younger generation, which creates social norms based on the observance of ethical rules prescribing good behavior. There are also explanations related to sanitary and hygienic norms, and the ritual nature of the use of the tip, which was a historically established tradition, the practice of which in some regions is disappearing.

There are, of course, many other food taboos among indigenous peoples. For example, in the Evenki food culture there are also taboos that prohibit eating young (up to 1 year old) reindeer calves, reindeer spleen and many other taboos. Chukchi people do not eat the tip of reindeer heart, and also do not eat spleen. According to one of the Dolgans taboos, a pregnant woman is not allowed to eat wild reindeer meat, which can be explained with the seek to secure the health of the expectant mother and child. Dolgan people also have a system, which might have sources from the mythological threefold division of the world, accordingly men were supposed to eat only the upper part of reindeer, and women, respectively, the lower part. There are a lot of different examples of food taboos among indigenous reindeer herding peoples, they concern other animals not only reindeer, thus the taboos on eating bear meat is popular among some Evenki, Evens, Nenets peoples and others, that have a special bear cult. Food taboos related to consuming some birds, animals in specific stage of age or at particular season in the year have developed respecting attitude towards nature and the world around. Some food taboos were developed over decades to protect health and avoid poisoning.

In our opinion, these regulations in food behavior have serious grounds, based both on the religious-mythological component and the sociocultural component. Understanding of traditional food taboos as well as traditional knowledge of the indigenous peoples of the North, Siberia and the Arctic about taboos is very important, especially today when the issue of healthy nutrition and food safety is acute throughout the world.

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Alena Gerasimova (2018): Taboo in food culture of reindeer herders of the North, Siberia and Arctic (case study of reindeer tongue's tip) . In Mathiesen et al 2018: Arctic Indigenous Peoples Food Systems – the Role of Traditional Knowledge for Sustainable Development *Diedūt 1*, page 50.

3.3.4. *Nimat* - The Customary Law of the Even and Evenki peoples

PhD Mikhail Pogodaev, Chair of the Association of World Reindeer Herders

Many indigenous peoples have the tradition of gifting, sharing and reciprocity in their system of social relations. Formally, gift and gifting are voluntary in these societies, but in practice are required; enabling a system of social relations based on the gift that is wider than just economic relations (Godelier 2007). *Nimat* is the customary law of Even and Evenki. This law is related to hunting and reindeer herding traditions. In literature usually is written that *Nimat* is a sharing law, but it is a simplification of this tradition. It is more than just sharing. After a successful hunt, a person who killed an animal(s) would offer this as the gift to a friend or his relative. He usually takes only stomach with intestines or anything else which would be destroyed quickly. Other parts of the animal usually stay at the place where it was harvested. Then he went home and tell to his friend or relative that he gives him a gift (*nimat*) and that he can find this gift in a certain place. Then he explains him how it can be found. That person had to go himself to find it and bring the game back home and share it among other members of community (*Gayun*– sharing and distribution of game between members of community). He had to decide which part of the animal(s) everyone would get. (Nikolay Osenin 2017) *Nimatis* a fundamental law for Even people and food culture is deeply connected to this law.

<p>Открыта любому тайга – входи! Стучаться не надо, брат. Но только в своей сбереги груди Обычай отцов – нимат! Мы люди! Одна нам дается жизнь! Нас ветром сечет одним! Так, встретив путника, Поделись своей добычей с ним! Костер разведи, чтоб согрелся он Будь встрече нежданной рад. И вместе припомните вы закон, Таежный закон – нимат. Да будет опорой в моем краю Он всем, кто идет в тайгу. Но помни: кто помощь принял твою, <i>Тот пред тобой не в долгу.</i> Пусть даже и сделал ты все, что мог, – <i>Не жди взамен ничего!</i> Нимат – это наш перед лесом долг, Тайге отдают его! [Калитин 2006:40]</p>	<p>The Taiga is open for everyone – come in! There is no need to knock on the door brother. But only keep in your heart The Custom of our fathers – <i>Nimat</i>! We are people! We've only got one life! We are weathered by one wind! So, when you meet a wayfarer, Share your prey with him! Make fire that he could warm up. Be content with an unexpected meeting. And together remember the law, The law of the Taiga– <i>Nimat</i>. Let there be a mainstay in my edge For everyone who goes to taiga. But remember: he who accepted your help, Is not in debt to you. Even if you did everything you could - Do not expect anything in return! Nimat - it is our duty to the forest, We give it to taiga! (Kalitin 2006:40)</p>
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Game caught by one, is also for others: shared with all, and not only between those who are involved in the hunting, but also visitors will get their share – "*Nemada*" (share of the hunting without participation in it). Not only relatives but also neighbors, and even random people enjoyed unlimited hospitality and fell into the category of the *Mata*- a person who got a share of the game after hunting.

In the past, this custom, and law in the understanding of Even people, pervaded all areas of their lives: it has an explanation in terms of economy, in particular, distribution practices, and in terms of social life, as a mechanism for establishing friendly and, under favorable circumstances, kinship relations on the exchange. It was also deeply rooted in the mind of a hunter, who believed that hunting success depends largely on the goodwill of the host-spirits.

In Even traditions the custom of *Nimat* was elevated to the level of law. But the punishment for violation of this law will come not from people, but from nature. Evens believe that after successful hunting for a mountain-sheep, wild reindeer or any other animal if you do not share with your relatives or friends - then you will not have a hunting luck, you will get nothing. The custom of sharing game is a kind of social relations between people, but also relates to the relationship between the society / individual and nature: the need for sharing caused by the traditions based on Even and Evenki notions of our connection with the earth.

This was also an attempt to establish social relations with the world of nature and the spirit world in order to ensure vital functions and continued life. The apparent reason for sharing – the expectation of reciprocity and gift not only from a person, but from the nature/earth/host-spirits (because the hunter did the "right" thing). The accumulation of moral benefits, exceeds the scope of social links and moves into the sphere of relations between "humans – animals – spirit-owners."

Nimat provides territorial and economic relations between the nomads not only between relatives but also between unrelated clans. Probably, this custom helped Even and Evenki peoples settle Siberia so widely, where they had to live on the land occupied by other ethnic groups.

3.3.5 Food and family: The value of maintaining ancestral traditions

Alena Gerasimova, International Centre for Reindeer Husbandry

Reindeer herders of the Arctic and Siberia, who have long lived in harsh climatic conditions, gained skills and knowledge that helped them to survive and thrive for millennia. They have created such lifestyles, food systems and economy primarily taking into account the need to maintain health and to sustain in harsh conditions. Today there are close to 100 000 people in the world involved in reindeer herding, there are families that still lead nomadic lifestyle together with their children, which is a very crucial phenomenon. This encourages child's ability to adapt to the world around, the unity with nature, to learn traditions and gain experience, to speak native language and adopt the best knowledge of their people. By maintaining traditional lifestyle, honoring family and ancestral customs, and by consuming traditional food, northern indigenous peoples are able to preserve their health. Another important aspect here is traditional knowledge, which was accumulated by reindeer herders and food can be a tool used to transmit this knowledge to younger and future generation.

Reindeer herders' special way of life that had been developed over the centuries has predetermined their food system and food culture. Food culture plays significant role in formation an ethnic identity, allowing to preserve ethnic features, transmitting them beyond the limits of a particular culture. We are familiar with traditional food and its taste since our childhood, we eat what our family and people around us are eating. It turns out that by eating food, we are not only saturate our body with nutrients, vitamins and minerals, but also on a subconscious level, we consider ourselves a part of this society, this particular ethnic group. Dietary systems have strongly changed over years among many indigenous peoples of the Arctic. In many places people eat primarily marketed foods and fast food, which undoubtedly affects their health. It is important to shape children's food traditions since early childhood; here the intergenerational transfer of traditional knowledge on food takes place.

Reindeer herders still follow old traditions associated with daily meals including food taboos, moreover these traditions are part of their lives. In their families, children acquire behavioral rules that are formed by observing adults. Prohibitions (taboos) and signs are the basis for raising children – they develop respecting attitude towards nature and everything around: food, household items, people and animals etc. In turn, the older generation tries to show how to behave in certain situations, while preserving traditions and customs of their ancestors.

Involving children and youth in working with reindeer is also necessary in introducing them to the values of their ethnic culture. Indeed, reindeer herding, fishing and hunting, which are the main traditional activities for reindeer herding peoples, are the major suppliers of food products.



Photo by Manne Stenros

3.3.6 Sámi traditions of freshwater fishing

Mikkel Anders Kemi, International Centre for Reindeer Husbandry

Within Sámi and especially within the reindeer herding society, reindeer meat is the most commonly used raw material for food and thus also what is eaten mostly in various forms, as fresh, dried or as smoked meat. But reindeer herders also have a tradition of fishing, especially in freshwater lakes.

In the past it was popular to fish fresh fish for food in the spring. The spring was a time when other fresh food was not easily available. Therefore, it has been a good addition to fish in freshwater lakes on the ice in the spring, often in connection with spring migration of reindeer from winter pasture to summer pasture and in connection with the calving. The best time to fish is when the ice is melting and one can fish in the natural open channels in the ice. Then it is popular to fish especially for the Arctic char. The most common way to prepare this fish is to boil it, or fry it, and eat it with bread, as the access to potatoes and vegetables was not as good as it is today.

During the summer, there was a transition to do fishing with nets in the lakes when the ice started disappearing. It happened, among other things that women and children remained on the tundra over the summer after the reindeer herds started moving towards summer pasture after calving in July. Then they stayed by lakes and lived in tents made of turf. This was due to relatively long migration distances and that reindeer herds returned before rut season and thus did not stay long on summer pastures. The reason why they stayed at various fishing lakes was to ensure they had access to fresh fish all the time. Then they fished mostly every day and lived mostly on fishing until the fall and the reindeer herds were back. The type of fish they were fishing and eating depended on what was available in their areas. They often stayed at lakes containing both whitefish and char. Then much whitefish was fished. Fish that was not cooked for daily food was smoked and salted, for better preservation of the fish and to provide a variety of food.

Earlier, many resident families had their "own" lakes in which they fished, and it was not common for others to get there and fished in the same lakes. It was enough fishing lakes for all families. While the reindeer herders mostly fished in lakes along the migration routes and otherwise in lakes where they had reindeer. Many of these lakes are also very weather dependent. If the weather, more specifically wind, is northerly, it is not point to fish, as you get nothing.

Another good fishing technique is to fish with nets under the ice, just after the ice has settled. Then it is common to fish for especially whitefish. Some reindeer herding families fished in that way, but it was also common for permanent residents to do fishing with nets. Most of reindeer herders had a special relationship with some permanent residents who often fished whitefish, salted it and gave it to the reindeer herders when they returned to Kautokeino for the winter. In return, they got reindeer meat from the reindeer herders. This is also because most of the lakes where one gets whitefish are in areas where reindeer herders do not arrive until the winter. Thus, the reindeer herding families did not have the opportunity to fish there during the fall. Since

most families had their 'own' fishing lakes where no others fished, they could manage the fishing lakes well without fishing too much or too little.

The most popular fish for reindeer herders have been char and whitefish. Besides eating fresh, preferably boiled, but also fried, they were often smoked and salted. This for better preservation throughout the autumn and winter. Especially, the whitefish is a species that can withstand long periods of salting without any impairing of the quality of the fish.

Other fish species, such as trout were also eaten, often in the same way as char. Other fish species such as pike, burbot and perch were seen as undesirable and were not preserved. It is only in recent times that the sámi have their eyes opened to these fish species and discovered that they taste good.

With today's access to fresh foods throughout the year, it has become less common to harvest fish from the nature. There are still those who do that, but to a much lesser extent than before, at least to increase the supply for food. It is a pity that such traditions and knowledge in managing fishing lakes and making use of fish become less as time goes by. Therefore, there had also been a need to document the reindeer herders' knowledge within fishing in freshwaters.



Photos by Mikkel Anders Kemi

3.3.7 Food and languages: A way to preserve cultural and historical heritage of indigenous peoples

Svetlana Avelova, International Centre for Reindeer Husbandry

An integral part of the Arctic is the indigenous people, who for many centuries lived in a harsh land, side by side with nature. Reindeer husbandry existed for thousands of years and maintained until today.

At present, when globalization processes and industrial development continue throughout the world, it is extremely important that reindeer husbandry continues to exist, which means Arctic indigenous peoples should have the opportunity to lead a traditional way of life. There are many challenges that can cause irreparable damage to the unique culture of reindeer herders. Among them, language loss is a major one.

Language keeps the history of the people, permeating all spheres of life. There are indigenous peoples whose language is currently endangered. The main reason for this is that some indigenous people are no longer engaged in traditional livelihood.

In order to preserve the unique diversity of languages, and at the same time the use of languages, it is necessary that indigenous peoples remain to be engaged in reindeer herding and continue to eat traditional dishes and products. Traditional food culture contains the cultural and historical load and is one of the most important parts of the material culture of the people, along with household items, clothing and housing. Traditional food reflects the livelihoods of the people, their economic activities. The names of dishes in the language of the indigenous peoples of the Arctic are associated with the traditional way of life. Methods of preparation, processing, storage and production of food are rich traditional knowledge, heritage of the people. The language fully describes all the actions of the cooking process. For example, it starts with the customs of hunting animals, hunting rituals, rules for slaughtering, names of carcass parts and so on - all these actions fully encompassed and accompanied by the language.

The nutrition vocabulary is very rich. These are the names of dishes, products, animal types; special terminology used in rituals, traditions, folklore; methods of slaughtering, preserving products in the Arctic environment conditions. It is also crucial that indigenous peoples' traditional knowledge on food culture is thoroughly documented. Fixation of linguistic material - wide range of terminology used in reindeer husbandry, fragments of folklore (fairy tales, proverbs, sayings, riddles, etc.), the memories of the older generation should be made.

There are many scientific and educational institutions are engaged in the issue of preserving the languages and culture of indigenous peoples, among them the Institute of Circumpolar Reindeer Husbandry of the University of the Arctic (UArctic EALÁT Institute) is worth special mention, where reindeer herding is studied in the interdisciplinary aspect. We recommend supporting courses and seminars conducted by the UArctic EALÁT Institute in collaboration with the Association of World Reindeer Herders and the International Center for Reindeer Husbandry, which will involve Arctic indigenous youth and which aim is preserving unique livelihood of reindeer herders, as well as their languages and culture.



Photos provided by the Family community of small-numbered indigenous peoples of the North - Evenki named after V.S. Sidorov. Photo credit: Lyubov Sidorova: 1) “Khulikte” (dried meat in Evenki); 2) Oleg Sidorov cutting meat for “khulikte” (dried meat in Evenki).

References:

Svetlana Avelova (2018): “The Food Concept in Evenki Language (Linguoculturological aspect)”. In Mathiesen et al 2018: Arctic Indigenous Peoples Food Systems – the Role of Traditional Knowledge for Sustainable Development. *Diedūt* 1, pp. 61-67.

3.4. Food governance

3.4.1 Transforming education: Traditional indigenous knowledge-based education making our food culture visible

Inger Anita Smuk, Chair of the Board, International Centre for Reindeer Husbandry

“We are the champions“

The Eallu Cookbook was awarded as the best food book in the world, the world's best book on Arctic food and culture and as the best book in the world.

I note that President Edouard Cointreau of Gourmand Awards said in his statement that this was completely new and unknown to the jury, who does not consist of just anyone in food culture in the world. And he asked why the world did not know about this rich food culture in the Arctic.

With this, we have a unique opportunity to focus on food and education. And what is better than we ourselves take responsibility and develop the knowledge about our food and what kind of education is needed. All the knowledge that reindeer herders in the world have about food, must be recognized as an important knowledge and made available, especially in communities in which they live. The fact is that this food culture is virtually invisible in our societies. And we are offered food that is something completely different from what we are familiar with. It is food that is industrially produced, holding ingredients that we simply do not know where they come from and what they contain.

Today, there is little scientific documentation of our food, and thus preventing to use traditional knowledge when producing for sale. Food authorities perceive this as unhygienic and polluting for the environment. We can actually do something with this by facilitating education based on our own premises, where focusing on documentation of the unique products and production process.

Once this knowledge is acknowledged, we teach our children and youth learn to be even more proud of their own food culture. Many of them are motivated in this way to take education within their own food traditions. We have youth today, who take education in food, that does not learn anything about their own food traditions. That is what we need to change.

It would be ideal to have our own educational programs in order to increase production of various food products, where one can learn how to develop products for sale and distribution. When thinking about traditional food products of reindeer, one needs also to develop slaughterhouses that give possibility to take care of everything from the reindeer, such as blood, heads, hooves, intestines, and other parts in addition to the meat. And one must be careful to see which animals are slaughtered in order to be able to use the slaughtered animal at the maximum for food and production of equipment.

In Scandinavia today, the focus is on slaughtering of calves, which, according to my view, is the biggest threat to women in reindeer husbandry and thus reindeer husbandry. The focus is that the calf should be slaughtered when it is most meaty. This makes the skin deteriorated for use to make clothes. The antlers are not suitable to produce equipment and tools. The meat and most of the other parts cannot be compared with meat from adult reindeer. One does not get the same materials to produce traditional food products. In this way, women are pushed out of reindeer husbandry, as they do not have their own products to work with. The structure of the herd and number change totally. This requires big herds with many female reindeer to produce all the calves that the industry needs to produce their meat products, and what is in addition to meat becomes waste problem.

By having a facilitated education for food, one gets a living community that takes care of its' culture and way of living.

3.4.2 Our vision of an Arctic Indigenous Peoples' Culinary Institute

Anders Oskal, Secretary General of the Association of World Reindeer Herders, Executive Director of the International Centre for Reindeer Husbandry

“...using our own knowledge to build our own societies, we must do it ourselves.”

The Arctic is presently experiencing historical changes, not least regarding value creation in local communities. We believe all available knowledge – traditional indigenous knowledge as well as science - should be put to use in local value creation in order to shape good Arctic societies for the future. Creating value from one's own resources and knowledge should be an opportunity afforded everybody, based on creativity, local involvement and leadership.

At the same time, the food traditions of Arctic indigenous peoples represent some of the least explored areas of world cuisine today. As the jury of the 23rd International Gourmand Awards highlighted, EALLU has brought forward “...*the food culture of places that have been known by very few people on the planet*”.

Increased knowledge about the food culture of Arctic indigenous peoples is a key fundament for adaptation to Arctic change, building resilience, and maintaining the cultures and societies. Documentation and research can and must be used to increase local value creation.

EALLU youth, ICR and WRH now suggests to develop an “*Arctic Indigenous Peoples' Culinary Institute*” with documentation, research, courses and education, with the participation of indigenous youth from the Arctic, including institutional partners. *The institute is envisioned to be the best culinary institute in the fields of food, health, knowledge and value creation in the Arctic.*

A key objective is increased value creation locally, based on the production of raw materials from reindeer herding, fishing, hunting and gathering in the circumpolar north, based on traditional indigenous knowledge, as well as contemporary research on nutrition, health and value creation. The wish is to develop methods and skills to improve the economy and at the same time maintain the resilience and sustainability of indigenous human-coupled ecosystems. We acknowledge that the traditional indigenous knowledge among traditional livelihood professionals is the foundation for a sustainable management of nature, and we should ensure indigenous peoples' economic freedom, access to and ownership of the most profitable parts of the value chains.

There are two main pillars in the vision of this virtual institute, as developed by indigenous youth participating in the EALLU project:

- Becoming the leading authority on knowledge tied to indigenous culinary knowledge and value creation in the Arctic, as a hub of culinary culture, understanding and innovation in the north.

- To be a centre of knowledge and culinary experience aiming to become an attraction for people who are interested in indigenous culinary culture and climate adaptation in the north.

The institute is envisioned to coordinate diverse documentation and research programs. Such programs will focus on unique nutrition content of proteins, fat, vitamins and antioxidants of reindeer meat and Arctic food resources, how these are found in the raw materials, are preserved during conservation and are part of everyday cooking, and how these impact culinary culture and health.

A unique feature of this initiative is the combination of scientific networks and partnerships with top national and international universities, new methodologies for documentation, application of traditional indigenous knowledge, and a livelihood-oriented grounding on the part of the indigenous communities, traditional livelihood professionals and indigenous youth all over the Arctic.

This multifaceted and complementary knowledge and resource base also provide a *unique foundation for innovation, born in the intersection between academia and business, between science and traditional indigenous knowledge, and between “modernity” and traditions.*

The Brundtland-commission’s report to the UN, «Our Common Future», and the fall of the Iron Curtain paved the way for a new, historical and unique co-operation between the indigenous peoples in the Arctic, notably the nomadic indigenous reindeer herding peoples. The changes in the Arctic imply that this cooperation should be developed further, with an international focus on indigenous peoples’ culinary culture and people-to-people exchange. Arctic change of course represents both challenges and opportunities. An opportunity should be an opportunity for all, including the Arctic indigenous communities.

A proverb says that “the tide lifts all boats”, and the development of the Arctic may be seen as such a tidal wave. It is crucial that also the small “boats” of the indigenous peoples be made seaworthy, so that also they can keep afloat when the tidal wave comes, so that they may safely reach the shore when the wave at some point in time will recede. *Gazing into the future horizon of Arctic change, the Arctic Indigenous Peoples’ Culinary Institute is a measure aimed at empowering the indigenous communities to ‘keep afloat’ through a focus on the peoples’ food systems, culinary culture, knowledge and identities.*

We are therefore seeking to develop the Arctic Indigenous Peoples’ Culinary Institute with a program for documentation, higher education and research, where indigenous youth from the Arctic will participate and can contribute. We welcome participants in this co-operation, to assist in jointly developing the institute and the knowledge programs. This initiative also holds some potential to mediate conflicts between developers and indigenous communities in the Arctic, as it would – if successful – help

turning Arctic change into opportunities also for the Arctic indigenous peoples. This is a way to achieve the UN SDGs, leaving no one behind.



Photo by Anders Oskal, ICR.

3.4.3 A vision of education: Developing a new international master degree program in sustainable reindeer husbandry at Sámi University of Applied Sciences

Assoc. Prof. PhD Inger Marie Gaup Eira, Sámi University of Applied Sciences.

Future sustainable development and governance of reindeer herding will face major challenges related to rapid changes in the Arctic. Furthermore, traditional areas of reindeer herding in the Arctic have increasingly become interesting for other interests such as the resource extraction industry. With a changing climate and increased industrial development, the ability to adapt the fine-tuned survival skills of reindeer herding has become jeopardized as land encroachment can terminate, block or delay critical reindeer migrations between winter and summer pastures. Traditional knowledge, culture, and language provide central foundations for reindeer herders' adaptation and resilience building in the face of the rapid changes in the Arctic. This also includes food culture as basis for local economies of indigenous peoples. Facing these challenges will require competent individuals with understanding and knowledge based on different spheres of knowing, training of future indigenous leaders, and use of all available knowledge.

Reindeer husbandry is by nature multidisciplinary, and thus research on reindeer husbandry should also be multidisciplinary, embracing multiple disciplines and multiple sources of knowledge, and including the relationship between and the combination of science and traditional indigenous knowledge.

There are currently no master degree programs within the field of sustainable reindeer husbandry. There is a definitive need for such a master program to graduate students in order to advance traditional knowledge, research and policy within this field. The premise of master degree program in *sustainable reindeer husbandry* is the central role of reindeer husbandry in reindeer herders' societies in particular, and in Sámi and other indigenous societies in general. Increasing the number of experts on sustainable reindeer husbandry within the academic sphere would be of great significance for the practice of reindeer husbandry at a circumpolar scale.

Why the name *sustainable reindeer husbandry*? The first part of the program name, *sustainable*, shows and mirrors a central concept used in the governance and management of reindeer husbandry. Simultaneously there is knowledge within the Sámi reindeer husbandry which accommodates an alternative understanding of the concept, which is more sustainable in the ecological, economic and cultural sense. The approach to the concept accommodates the various perspectives, i.e. the different ways of knowing, including the ways in which it is interpreted based on reindeer husbandry thinking and understanding. The second part of the name – *reindeer husbandry* – refers to the nomadic, pastoral, family-based and indigenous character of the livelihood, which includes the inherent land-use, customs and management-system. The livelihood has its own knowledge base, in which reindeer herding knowledge is transferred orally from generation to generation.

The envisioned Master program in sustainable reindeer husbandry reflects the academic profile of Sámi University of Applied Sciences (SUAS). Since the establishment of SUAS in 1989, all plans and priorities have been designed to benefit Sámi society in the modern age, based on Sámi cultural heritage. Within this, traditional knowledge and reindeer husbandry studies are central disciplines.

The societal relevance is apparent in the accentuation of perspectives on Sámi reindeer husbandry including herders' technical language and ways of knowing. In the present society, the position of reindeer herders' knowledge and technical language (e.g. Sámi language) and communication of knowledge is weak in the governance and management of reindeer husbandry. In Norway for instance (and to varying degrees in other Nordic countries) Sámi language laws intend to secure the use of Sámi language in the geographical areas which are officially recognized as core Sámi areas, and by public administration in matters which concern the Sámi people, and in our case Sámi reindeer herding people.

The program will be for those who want to work eligibility in the field of studies in reindeer husbandry or in comparable fields where high quality of knowledge is needed to work on different interlinked spheres of knowing involving different approaches to basic aspects of traditional indigenous livelihoods. Therefore the name of the master degree program conveys the information to persons that have completed bachelor studies and want to specialize in sustainable reindeer husbandry disciplines, such as Sámi reindeer husbandry, sustainability, climate change, food culture and food products, law, and governance.

The students of such program will acquire research-based knowledge from different spheres of knowing about the profession of sustainable reindeer husbandry, its impact and relevance for reindeer herding communities, and its role in shaping reindeer herding societies in the future.

About program contents, structure and target groups:

A master degree program will be a 120 ECTS study, in accordance with the Bologna process and laws and regulations on education in Norway. The main societal purpose of the program must be to educate independent and thorough experts who are, based on relevant and current knowledge, able to work to advance the disciplines of sustainable reindeer husbandry, and for the benefit of reindeer herders', Sámi people, and the greater community. After completing the program, the candidates will have gained competence to work in a professional sustainable reindeer husbandry setting in a leading or specialist role: such as leaders in private business, public managers, development director, consultant, teachers, academics etc. The students will have mastery of the legal and ethical requirements of the profession, including international regulations and conventions guiding the field. They will have a capacity for professional self-reflection and for understanding the challenges facing sustainable reindeer husbandry. All of these are central for any key position within the field of sustainable reindeer husbandry. Completing the master studies would lead to the degree Master of Science in Sustainable Reindeer Husbandry.

The program is aimed at motivated indigenous students. Students must be able to acquire knowledge through Sámi language and/or English. Command of indigenous reindeer herder people's languages is an advantage. Likewise, experience working within reindeer husbandry issues is also considered an advantage merit.

The program will be seeking to recruit candidates from across the indigenous regions in Norway, Sweden, Finland, Russia, north America, and the Nordics, as well as from other indigenous areas from across the world. SUAS has access to a wide base for student recruitment, in its established networks and collaboration with higher-level education institutions across the circumpolar north.

The central themes of sustainable reindeer husbandry from reindeer herders' and states' perspectives will be discussed and analyzed. The courses focus on aspects of knowledge and practices dealing with the sustainability of nomadic reindeer husbandry and herding, as well as different ways of approaching and understanding the sustainability related to reindeer husbandry, and the theories behind these. Included in this will also be topics such as Reindeer herders' food and their social-ecological food system in a changing arctic; adaptation, vulnerability and resilience in reindeer husbandry to climate change; the legal protection of reindeer husbandry from an international and national perspective and a customary law based understanding of reindeer herders own rights. Through the master degree program, students will contribute to new knowledge and understanding in order to increase sustainability in reindeer husbandry and herding, and thereby strengthen the reconciliation between the interlinked and partially conflicted spheres of knowledge.

There are several research projects at SUAS and ICR, which are based on an approach to reindeer husbandry based on multi-disciplinarily and different ways of knowing. One on-going research project is RIEVDAN (Rapid changes –challenges and/or opportunities for sustainable reindeer husbandry, supported by Research Council of Norway), in collaboration with ICR. The research project is based on and according to goals and strategies set by SUAS and will provide knowledge base for a new Master Degree Program in Reindeer Husbandry Studies using a multidisciplinary approach. The project research traditional cultural capabilities in reindeer husbandry and the opportunities embedded in traditional indigenous knowledge and scientific knowledge. The focus is on adaptation to change and reconciliation. It will explain the tensions between the two interlinked spheres of knowledge involving different approaches to basic aspects of reindeer husbandry and herding, contribute to new knowledge and understanding in order to increase sustainability in reindeer husbandry and herding, and finally strengthen the reconciliation between the interlinked and conflicted spheres of knowledge. The focus of the research project will be directly relevant and applicable to the master program. The process and the findings of the research project will be directly fed into the teaching and the program as a whole. The students will be incorporated in such research projects.

Key institutions and networks in this work are International Centre for Reindeer Husbandry (ICR) and the UArctic EALÁT Institute - University of the Arctic Institute for Circumpolar Reindeer Husbandry.

3.4.4. Arctic biodiversity as basis for food production systems: The role of traditional and expert knowledge in sustainable use, protection and management of circumpolar biodiversity

PhD Iulie Aslaksen, Statistics Norway, and PhD Ellen Inga Turi, Sámi allaskuvla/University of the Arctic EALÁT Institute

Earlier version presented in Lávvu dialogue, Arctic Biodiversity Congress, Rovaniemi, 11 October 2018.

1. International agreements on biodiversity and traditional knowledge

International agreements on biodiversity are important tools for developing new approaches to bring biodiversity values and traditional livelihoods based on biodiversity into the policy agenda. The United Nations (UN) Sustainable Development Goals (SDG) is a framework that receives increasing attention by policy makers. The importance of nature as home to indigenous peoples is recognized in Goal 15 Life on land: “Forests cover 30.7 percent of the Earth’s surface and, in addition to providing food security and shelter, they are key to combating climate change, protecting biodiversity and the homes of the indigenous population” [1].

The UN Convention on Biological Diversity (CBD) Article 8 (j) calls for use of the traditional knowledge of indigenous peoples to strengthen the goal of sustainable use and conservation of biodiversity [2]. The CBD recognizes traditional knowledge in the Aichi targets for biodiversity in Target 18: “By 2020, the traditional knowledge, innovation and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels”[3].

Based on recommendations of CBD Article 8 (j), CBD has adopted *Akwé: Kon* Voluntary Guidelines for the Conduct of Cultural, Environmental and Social Impact Assessment regarding Developments Proposed to take place on, or which are Likely to Impact on, Sacred Sites and on Lands and Waters Traditionally Occupied or Used by Indigenous and Local Communities [4]. The name is a Mohawk term *Akwé: Kon* meaning "everything in creation", to express the holistic nature of the guidelines.

These approaches recognize biodiversity as basis for livelihoods and food production systems and traditional knowledge as key to sustain nature-based livelihoods. This is documented in the book *Eallu* on food culture by indigenous youth in reindeer herding in Norway and Russia [5], in the report *Adaptation Actions for a Changing Arctic* (AACAA) [6], and in a scientific article in Nature Climate Change on changes in snow cover and loss of traditional indigenous knowledge [7]. Biodiversity is not only nature, it is the relation of nature and humans. Biodiversity and traditional knowledge are under

high pressure. Despite international conventions, there is lack of recognition of indigenous rights and traditional knowledge.

2. Traditional knowledge vs. expert knowledge

Traditional knowledge challenges scientific assumptions that science is value-free and that quantitative methods are the predominant scientific mode. Science has implicit normative assumptions, in terms of values and worldviews. What is needed is a plurality of values that can recognize traditional knowledge as one of several knowledge systems. Measurement of biodiversity is often based on ecological expert knowledge, with a different worldview than traditional knowledge. On the other hand, ecology and economics express different value systems when there is a demand to measure natural capital and ecosystem services from nature values that some people consider to be incommensurable. The Nature Index for Norway takes an ecological approach to express nature values without placing a price tag on nature [8]. The approach proposed by the United Nations, the System of Environmental-Economic Accounting Experimental Ecosystem Accounting (SEEA EEA) is a potentially more holistic framework for representing nature values [9]. The GLOBIO model describes impacts of human development and climate on biodiversity [10], and it is crucial to present model results for consultations [11].

Although the role of traditional knowledge is recognized in scientific approaches and international conventions, it is not sufficiently taken into account at national, regional and sectorial governance levels. As documented in research by Ellen Inga Turi, local knowledge is missing at different levels of governance [12]. The use of Sámi traditional knowledge in environmental and area management in Norway is rather limited [13]. Traditional knowledge is lacking in agricultural governance when reindeer herding is seen as a farm system, and in environmental governance when reindeer herding land is seen only as pure nature and not as a cultural landscape. There is need to develop guidelines for including Sámi traditional knowledge in planning processes, e.g. environmental impact assessments, in order to follow up the Norwegian Nature Diversity Act §8, and CBD articles 8 (j) and 13 (a) og (b).

In the ECONOR reports [14] on circumpolar economic statistics, macroeconomic and socio-economic data are seen together with natural resources as basis for livelihoods of the indigenous peoples and other Arctic residents. The book *Indigenous Statistics* [15] suggests the framework of *Nayri kati*[16], meaning “good numbers”, for an indigenous approach to quantitative methodology that questions the implicit normative values of the standard statistical approaches, by exploring indigenous voices, knowledges and understandings and integrate traditional indigenous knowledge.

3. Knowledge and power: Collective action, institutions, communication

In 2014 the Convention on Biological Diversity (CBD) stated that “Indigenous and local communities depend directly on biodiversity and its customary sustainable use and management for their livelihoods, resilience and cultures and are therefore well placed, through their collective actions, to efficiently and economically manage ecosystems using the ecosystem approach” [17]. Collective action expresses the understanding of cooperation of people in a community towards a common goal, reflecting the

understanding from Elinor Ostrom *Governing the commons: The evolution of institutions for collective action* [18], emphasizing the need to develop institutions that support mutual agreements as basis for nature management.

The Norwegian Agriculture Agency's report on self-determination in reindeer herding [19] recognizes the traditional Sámi approaches for conflict resolution based on the responsibility to be self-sufficient (*iešbirgen*), ensure common understanding through repeated conversations (*gulahallan*) and the common goal of finding agreement (*soabadallat*). Traditionally, it was the role of the women to ensure conflict resolution, by communication until consensus was achieved. The report recommends to develop conflict mitigating institutions at district level, local conflict resolution within reindeer herding, and arbitration (according to Reindeer herding Act), in order to strengthen the capacity to solve conflicts at local level.

In Sámi reindeer herding there is an integrated knowledge chain from the knowledge of the dynamics between the reindeer herd, pastures, seasons and weather conditions, to the knowledge of preparation of the meat and the use of antlers, skin and bone for clothing and for art and crafts (*duodji*). Reindeer herding is not seen as purely an occupation, but a lifestyle of the entire family, women, children and elderly people, who engages in the activities, a collective action, and it represents an activity for accumulation and inter-generational transfer of traditional knowledge [20].

Harvesting activities such as hunting, fishing and gathering are also crucial for Sámi livelihood and culture, both for reindeer owners and other groups of Sámi, and the Sámi use of outfields areas (*meahcásteapmi*) represents traditional knowledge related to several ecosystems: fishing in fjords, lakes and rivers, hunting of moose, birds and seals, harvesting of cloudberry and other berries, gathering of herbs, moss and peat, collection of fire wood, birch bark and wood for crafts, previously hay was harvested from meadows, still shoe grass for winter is harvested from mires, and coastal ecosystems provide sea weeds, shell, shell fish, sea birds and eggs[21].

From a legal perspective, it is crucial to recognize the total use by all Sámi groups of the resources they traditionally have used and harvested from: Reindeer herding, coastal fishing and rights to fishing, hunting, and gathering. In large areas in Finnmark Sámi groups have overlapping use and together have the majority of land use. From legal preparations it is assumed that the Sámi could have obtained property rights based on total use of the resources, by the ILO-convention 169 article 14 no. 1. Only by recognizing the total Sámi use of resources a correct solution of rights issues can be achieved, to fulfill responsibilities Norway has through the ILO convention and UN Declaration on Indigenous Peoples [22].

What is the importance of food and food traditions in the context of biodiversity and traditional knowledge? Culture develops from food production systems. The freedom to eat food from your own land and water is crucial. Food connects us to our homelands, in indigenous cultures as well as other cultures. Food reminds us where we come from, who we are, where we belong. The role of traditional and expert knowledge in sustainable use, protection and management of circumpolar biodiversity is crucial to

protect food production systems. Measurements of biodiversity need to address the values, interests and rights involved in the use of land. It is important to involve society in debates on the use and values of nature and culture, in order to secure that national policies are aligned with international conventions protecting biodiversity and traditional nature-based livelihoods.

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- [2] <https://www.cbd.int/convention/articles/default.shtml?a=cbd-o8>
- [3] <https://www.cbd.int/aichi-targets/target/18>
- [4] <https://www.cbd.int/traditional/guidelines.shtml>
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3.4.5 New economic models and innovation

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In a rapidly changing Arctic, the economy of the indigenous peoples of the North is facing challenges to adapt to climate change and globalization. The traditional economies that has existed for thousands of years has served as the foundation for the prosperity of indigenous peoples in the most severe natural environments of the world. However, over the past hundred years there have been major changes in the economic models of indigenous peoples of the Arctic. In many indigenous communities, attempts were made to transform their economy into "new" models ranging from capitalism to a socialist economy. This can be seen as having jeopardized the existence of these peoples, because the change in the traditional structure of the economy and social organization of indigenous peoples was undermined by erroneous theories and ideas that were implemented very often in the forms of various socio-economic experiments. As a result, the ancient traditional civilization of nomadic indigenous peoples today is under pressure.

Arctic indigenous peoples' economies were historically based on reindeer herding, fishing, hunting, gathering and different combinations thereof. Reindeer have always been and remain the foundation of reindeer herding peoples' lives. Reindeer provide people with shelter, food, clothing, security and are at the center of herding peoples' universe, the foundation of their cultures, languages, worldviews and ways of knowing. Reindeer are also the foundation of herders' economies, similar as caribou, wild reindeer and game are foundations for hunting economies.

The traditional livelihood of reindeer pastoralism represents a model of sustainable exploitation and management of northern terrestrial ecosystems based on experience accumulated over generations, conserved, developed and adapted to the climatic and political-economic systems of the north (Magga et al, 2011). It also represents a human-coupled ecosystem, which has developed a historical high resilience to climate variability and change (Magga et al, 2011; ARR, 2013).

Recently, the concept of circular economy has gained increasing global attention. In short, circular economy aims to eradicate waste, not only in manufacturing processes, but systematically throughout the whole economic model. In contrast, the linear "take, make and dispose" economy wastes large amounts of resources such as materials, energy and labour.

Food waste is a real challenge in the global food system, where a third of all food produced in the world is never eaten because is spoiled or discarded (FAO 2011). And the Arctic is no exception here. Just as examples, different estimates show that households in Norway dispose of edible food of around 42 kg per person per year, ie. equalling around 223 000 tonnes, and households in Finland dispose of edible food of around 120-140 000 tonnes each year or 20-25 kg per person. Total numbers across the

entire food value chains are in fact significantly higher. UN SDG sub-goal #12.3 states that global food waste should be halved by 2030.

However, as far as traditional indigenous livelihoods go, the circular economy concept is in no way new: In the traditional family-based model of reindeer herding, for instance, there are no such thing as waste from reindeer. Reindeer herding and other traditional indigenous ways of life and livelihoods are the oldest and best performing parts of circular economy. *Every part of the reindeer - from hoof to antlers - is seen as a resource, with some sort of economic use potential.* All parts can be utilized for something, if not human food then other applications like clothing, tools, artifacts for sale, and so on. This means that reindeer herders' food systems in some regards are wide in scope. And likewise, every member of the extended family is seen as an important human resource, where everyone has a role in the traditional economic model; men, women, children, youth, and elders, reindeer herders, their aides and other local helpers. This also applies to knowledge, where different members of the family would have partly different bases of traditional indigenous knowledge.

Within this holistic understanding of traditional family-based reindeer herding, one can find the essence of a true circular economy. And now the world outside indigenous societies seem to “rediscover” this model of thinking, forgotten in our time of “modernity” with its great scientific discoveries, increases of living standards, perceived endless world resources, and corresponding “universal faith in everlasting growth”. Or said in another way by Johan Mathis Turi: “...*from the beginning, human societies have been built on the application of traditional knowledge (...) As scientific knowledge developed and brought extraordinary results in almost all fields, a shift in people's attitudes towards traditional knowledge occurred and it gradually became devalued.*” (J.M Turi, in Oskal et al, 2009). And so, one could state that earlier understanding and models may have been too easily forgotten.

However, this original indigenous circular model has recently been weakened, due to policy choices, economic incentives, and assimilation. For example it seems to have more or less disappeared in the public/ visible/ official economy of reindeer herding in Fennoscandia the last 30 years, while it is still practiced internally within the families in variable degrees.

In the time of transition to “modernity”, western and soviet agricultural science was introduced to “modernize” reindeer herding into specialized meat production (Benjaminsen et al, 2016; Eira et al, 2018), and thus away from the diversity-strategy known from before (Eira et al, 2018; Benjaminsen et al, 2016; Magga et al, 2011; ARR, 2013). One can in aftermath at the very least conclude that these “experiments” have had unintended detrimental effects to the social organization and economy of reindeer herding and thus affected reindeer herders' ability to adapt to change and resilience of reindeer herding societies. And while objectives and intentions may have been good, as the saying goes, ‘the road to disaster is paved with good intentions’.

Reindeer herders have their own understanding and vision of the economy of reindeer husbandry, which are often different from those of the mainstream society and the

“western scientific tradition” (Turi, 2013; Turi and Keskitalo, 2014). Although, of course, we must recognize that western scholars have always interpreted the economic categories in reindeer husbandry in accordance with their ideas and practices of western economic science (op.cit). Herders, for example, would not have considered the number of reindeer only as a means of production. One of the reasons, as mentioned above, is that the reindeer is associated with all aspects of the life of reindeer herding peoples.

One of the authors visited all former Sámi owned field slaughterhouses for reindeer in Northern Norway in 2003, that had all been shut down in 1995-1998 due to new public regulations and their interpretation. This experience brought about a new realization. On the one hand, the reindeer herders interviewed underlined the importance of their own handling of the market for reindeer meat for their own economy. But another element was strongly and absolutely consistently brought forward in the visited reindeer herders’ own analysis: The importance of the closed field slaughterhouses for the whole *siida* (working collective), for the whole family, especially the women, and for utilizing every resource from the reindeer towards every market.

The direct economic role of women in reindeer herding was severely diminished with the new model that was introduced, which now meant pushing live reindeer onto transport trucks to industrial slaughterhouses, thereby in effect ending the valuable role of women and the family as an integral and traditional part of reindeer herding economy (Reinert, 2006). This is very serious to the future maintenance of reindeer herding culture, language, values and norms, and maintenance and transfer of traditional indigenous knowledge. The result is among other things loss of language and understanding of food, meaning also a loss of many traditional products for potential markets. In worse cases women almost completely disappeared from reindeer husbandry both formally and in reality, and this jeopardize the very foundation of reindeer husbandry as a family-based economy (Ulvevadet and Klov, 2004).

Attempts to specialize the economic activities of reindeer herders, and thereby decoupling the family, its different members and their different base of traditional indigenous knowledge from the economic activities, will thus have additional negative effects beyond just the economic loss of product-market combinations and diversity in economic adaptation; It can weaken the original family-based reindeer herding model, the very core model upon which all reindeer cultures have historically been built.

The traditional activity of reindeer slaughtering in the earlier field slaughterhouses, was in other words not merely an isolated economic activity to produce meat protein. It was the foundation for a whole diversity and range of economic and societal activities, undertaken by entire reindeer herding extended families, for the benefit of their societies, preservation of their languages and cultures.

Diversity is seen as a strategy for handling change (Maggia et al, 2011), for instance encapsulated in the Sámi term and concept of “*Birgen*”, ie. “to cope” (Pogodaev et al, 2015).

Wealth, according to the traditional understanding of reindeer herding peoples, is not only expressed by quantitative characteristics, but rather also in quality. We could for instance look at the concept of a "beautiful herd" (eg.in Sámi language - "*čappa eallu*"): What the term really expresses is that the structure of the herd is made up in such a way that it has been adapted to the available grazing conditions and pasture diversity, as well as to the changing climatic characteristics of the territory concerned, ie. taking into account the cyclical nature of the environment and climatic changes. This reveals a much more advanced and complex understanding than simply the aesthetic meaning of the term itself (Sara 2009).

In reindeer herders understanding, pastures/ good pasture conditions (in north Sámi language "*ealát*") are the foundation for the reindeer herd (Sámi "*eallu*"), and the reindeer herd is the foundation for the life (Sámi "*eallu*") of reindeer herders (Magga et al, 2011). While none of the indigenous reindeer herding peoples have the term 'sustainable development' in their languages, we still find an understanding of this concept in the above example, hidden in the language. While the term sustainable development might implicitly presuppose the maximizing of production or output, herders' traditional way of thinking is better expressed by for instance the Sámi term "*birgen*": If you have enough to manage or cope ("*birget*"), you have enough. Economy is therefore integrated into reindeer herders' own core understanding of their livelihood, though often with its own different departure points, and is expressed by traditional knowledge manifested through indigenous languages and ways of organising (Sara 2009).

And herein lies what we believe is the essence of this experience: An economic model that is not able to acknowledge and value the whole system of traditional activity as reindeer herding, is not appropriate. This is especially concerning because the changes observed and projected in the Arctic are fast and profound, significantly impacting indigenous peoples, their cultures, their knowledge, their youth, their food traditions, and their economies.

In the book "The great transformation" from 1944, political economist Karl Polanyi argued that capitalism had to create three "fictitious commodities" (ie. not originally for sale on a market) in order to work, that were not present in pre-capitalist societies: labor, ownership to land and money. While it could probably be easily understood that there are some fundamental differences between indigenous and non-indigenous societies, just *how* different they really are may perhaps be enlightened in this way.

The economic situation of reindeer husbandry in the Nordic countries is significantly different from the Russian situation, though in many respects the changes in the management of reindeer husbandry that occurred in the Nordic countries are similar at its core. In the 20th century in Fennoscandia there was also a process of attempting to "modernize" reindeer husbandry. The authorities utilized economic approaches of scientific research to "improve the efficiency" of the economic activity in reindeer herding, with a focus on meat production volume for instance in Norway. Today we can certainly say that reindeer husbandry in Fennoscandian countries is likely the most "modernized". Reindeer herders are using mechanized transportation, a developed

production system and good social infrastructure, and there are significant markets for reindeer products. However, the conceptual approaches that have been used in Fennoscandia, introduced by various researchers, were not devoid of the shortcomings that were inherent to the planning and administration of the economy of the Soviet period of Russia's development. Reinert (2006) for instance states that in 1976 agricultural principles and a “planning paradigm” were introduced to reindeer herding in Norway. Subsequently, slaughtering and marketing - the most profitable activities in the value chain - came under government regulation and non-indigenous ownership.

A common feature of public policy in Russia and some of the Nordic countries is the desire to maximize the productivity of reindeer husbandry and introduction of ideas of mass agricultural production, which Erik Reinert calls the introduction of "Fordism" to reindeer herding (Reinert, 2006). However, due to the specifics of reindeer husbandry, cyclicity of natural variations and significant differences of reindeer herding from agricultural production, that desire might actually make reindeer herding more vulnerable to the challenges of climate change and globalization (Reinert 2006; 2009; Benjaminsen et al, 2016).

In political economy, the concept of "sustainability" of management first emerged in the second half of 19th and the first quarter of the 20th century in Western Europe. According to the theory of "sustainability of small peasant farming" small-scale production in agriculture has an advantage over large and therefore is more viable. The founders of this theory were economists Klawki, Hecht, Puzor and Brentano. In Russia, prominent representatives of this theory have been M.I. Tugan-Baranovsky, P.B. Struve, S.N. Bulgakov and others. According to supporters of the sustainability of small peasant farming, the owners of small farms and their inherent greater diligence, hard work and thrift produces products at lower costs than large farms, favouring the efficiency of small-scale production over large.

Therefore, it seems that the economy of reindeer husbandry should also develop along the path of small-scaled reindeer businesses on a family basis, using traditional knowledge and modern technologies in the field of processing of reindeer products. It is necessary to revise the concept of the ‘development’ of reindeer husbandry and develop new approaches and models for reindeer husbandry, which could fit with specific family-based nomadic reindeer husbandry and fluctuations in the natural and climatic conditions of the Arctic and Sub-Arctic.

However, herders also rely on a *diversity* of resources in their economic adaptation, including traditional activities such as hunting, fishing, gathering and more, as well as combinations of the above. Reindeer herders’ adaptation strategies would seem to be focused on flexibility (ARR, 2013), constant adaptation to changing conditions (following Turi, 2007; Reinert et al, 2009, Eira et al, 2018), and risk spreading through diversity in social organisation, economy and through understanding biological diversity (following Magga et al, 2011; ARR, 2013; Benjaminsen et al, 2016). Such a starting point does not go well together with a planned-economy paradigm of maximizing output based on monoculture specialized production – which some argue is exactly the model that has been introduced and consolidated in Sámi reindeer herding in Norway by public incentives over the last 30 years (see Benjaminsen et al, 2016). The so-called

Lenvik-model (see Benjaminsen et al, op cit) with the slaughtering of reindeer calves for maximum meat production, in kilos, with subsequent reduced diversity in herd structure, use of pastures, types of slaughter animals, even industry structure, reindeer product ranges, reindeer product value chains, and so on. All this taken into account, the contrast between these two ways of thinking and knowing appears striking.

A fundamental challenge, then, is that still today *there seemingly exists no theoretical-empirical economic model adapted for, made for or genuinely suitable for reindeer herding* as a traditional, family-based, nomadic livelihood. Still, the economic models that are used often originate from the agricultural sector, as eg. Reinert (2006) points out. One issue is if the economic logic of family-based reindeer herding is not fully understood; another issue could potentially be that one might *believe* one understands it, for good reason by using one's own models, while in reality one does not. In other words, to quote the Stanford economist Moses Abromowitz in 1993: "*...it ain't what we don't know that bothers me so much; its all the things we do know that ain't so.*"

So then, what would a new adapted economic model for reindeer herding look like?

First of all, one must *understand reindeer herding for what it actually is* - a traditional, nomadic, family-based way of life for northern indigenous peoples, based on utilization of marginal resources through mobility and diversity, under strong cyclical and natural variability, and governed by traditional models of self-management and traditional indigenous knowledge developed over generations of close interaction with and dependence on nature. This alone has major implications, as the agricultural models used hitherto to understand and regulate reindeer herding from outside have largely failed to grasp the difference.

In our opinion, one should also recognize that reindeer herders have real economic freedom and are in position and able to utilize arising opportunities from changes in the north, on their own terms, based on their own needs, resources, knowledge base and people, so that the opportunities of our changing north can be real opportunities for all.

Very often reindeer herders' rich understanding and knowledge-base of food and crafts has not been fully utilized for economic development in and by their societies. There is also a need to recognize that revitalizing traditional products for modern markets - on reindeer herders' own premises and by reindeer herders themselves - can be a good approach for innovation and strengthening reindeer herders' economy.

At the same time we have to note that non-adapted food regulations can force reindeer herders' production out of their own control, and there is a need in bringing quality control back to the producers, by modernizing and adapting the veterinary rules to accommodate reindeer herding and realities of the circumpolar north, and by better education of controllers in the EU system building on the model of veterinary zoo-technicians in Russia.

Climate change is also about what we are going to eat in the future, and there is a need for food security for reindeer herding peoples based on their equitable access to and

possibility to select their own resources, food empowerment through utilization of their Traditional Indigenous Knowledge, sustainable use of all resources in accordance with their traditional food systems, food safety regimes adapted to realities and Indigenous cultures in the circumpolar north, focus on health and well-being, and local economic development and value-added from within their own societies.

Here we also have to mention that illegitimate imitation of traditional products reduce and discredit reindeer herders' markets which can weaken reindeer herders' knowledge base, intellectual property, as well as their economy, and furthermore constitute inappropriate representation of reindeer herders cultures. This may apply to a diversity of products like food, handicrafts and also tourism services. Therefore indigenous origin branding for reindeer herders' products may be a way to protect knowledge and secure fair trade.

The regulations of modern slaughterhouses do not provide for traditional utilization of raw materials, there is a need for developing new technologies in this regard, and there are already some initiatives to develop micro-scale and mobile reindeer slaughterhouses.

As the conclusion we would refer to the the Jåhkåmåhkke Declaration on the occasion of the 6th World Reindeer Herders' Congress in Sweden in 2017, which states:

"...Recognize that reindeer herders base their existence on a holistic economic system, where diversity and utilization of marginal resources are key fundamentals, a system that is uniquely adapted to the seasons and risks of our natural environment, that keeps our people and societies healthy, that is integrated and expressed in our cultures and based on our Traditional Indigenous Knowledge, and that has kept our peoples secure from time immemorial, and underline that it is very important that this holistic system is understood and taken into account in public management."

In other words the new model for reindeer husbandry should utilize every resource, make use of everything from the reindeer and other food resources, and thus remain a true circular economy. This model should secure that everyone in the family will have the role in reindeer herding, to prevent *outflow of people*, and that every part of our traditional indigenous knowledge systems is used, and that *diversity* in products, markets, knowledge and risks are observed. At the same time there is a need to make sure that the system will allow you to take only what you need, in contrast to maximizing of growth paradigm.

The new model also should take into account the reality and poor state of economy locally, the unique geography of reindeer husbandry, enormous distances, generally weak infrastructure, communication etc. There are also other important aspects which need special attention, like economy of scale, including also large-scale disadvantages and small-scale advantages. Another fundamental factor for any economy that must be carefully considered is the *motivation* of individuals and society. The new model has to be innovative and in this regard transfer of knowledge and skills is essential. Finally, according to the so-called resource-based view of strategy, the *internal resources and capabilities* of firms in terms valuable, rare, costly-to-imitate and properly-organized

resources defines sustainable competitive advantage. In other words, the traditional indigenous knowledge base of our peoples can be seen as profitable strategic economic resources according to this major new school of economic theory, which the new model should fully explore.

One of the outcomes of the EALLU project is the *Food Innovation Leadership Program* which was initiated by the International Centre for Reindeer Husbandry (ICR) and Nord University of Norway in realization of the Arctic Council Fairbanks Declaration point # 22, in which Arctic States

“...Encourage the establishment of a program for training indigenous youth in the documentation of traditional knowledge related to food, food entrepreneurship and innovation”.

As this report is written, efforts have been undertaken to develop and establish a pilot version of such a university level educational program, under the *Training of Future Arctic Leaders* umbrella of the UArctic EALÁT Institute at ICR. The pilot is envisioned for implementation in April 2019 with 25-30 young indigenous students from across the Arctic, as a deliverable from the SDWG EALLU project.

Another outcome of the EALLU project is a separate *Northern Sea Routes initiative*. The main goal of this project is to investigate to which extent and how the Northern sea routes can provide economic opportunities for Arctic indigenous societies, through increased market access and local value added. The vision is *to diversify local economies by solving a problem of bringing untapped resources to new markets, in a way that benefits the primary producing indigenous societies*. One wish to investigate to what extent and how existing technologies and economic models for food production and logistics can be utilized for off-shore slaughtering, processing and distributing reindeer and fish from the Siberian Arctic. Innovation is also combining known things in new ways, and this initiative represents an innovative knowledge contribution on how local indigenous societies can get into position to also exploit the opportunities arising from a rapidly changing Arctic.

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3.4.6 National Centre for Reindeer Herding Development and the Nenets Food System of Yamal

Nechei Serotetto, Elvira Okotetto, National Center for Reindeer Husbandry Development, Salekhard, Yamalo Nenets Autonomous Region, Russia.

The National Center for Reindeer Herding Development was opened in Salekhard in November 2018. It is headed by the Council President of the Association of World Reindeer Herders Sergei Nikolayevich Kharyuchi.

The activities of the Center will be aimed at:

- Monitoring the current state of the traditional economic sectors of the indigenous peoples living in the Arctic zone of the Russian Federation related to the herding and use of reindeer;
- Solving the tasks of ensuring the strengthening of the ethno-cultural development of economic communities engaged in the herding and use of reindeer;
- Assessment of the risks and development of reindeer herding due to global climate change and other factors;
- Solving other tasks related to the development of reindeer herding in the Arctic zone, indicated in the “Fundamentals of the state policy of the Russian Federation in the Arctic for the period up to 2020 and further perspective” and “Development strategy of the Arctic zone of the Russian Federation and ensuring national security for the period until 2020”

The Nenets Food System of Yamal

The nutritional system of indigenous peoples in Yamal is based on the consumption of unique food products. All year round, the indigenous people of Yamal eat fish and its caviar in different ways (raw, dried, smoked, boiled) depending on the time of year. The main dishes for the northern people, leading a traditional way of life, are made from venison, which is served on the table in various forms. Depending on the seasons, they eat geese, white partridges and polar hares. These are all products which it is incredibly interesting to work with and there is a potential to be developed in order to be able to show the authenticity of northern cuisine, both in the North and in all other regions.

It is also possible to serve up-to-date traditional dishes in the restaurant. Nothing prevents northern restaurants chefs from visiting indigenous communities, exploring their cuisine, and based on local culinary to create new dishes based on traditional dishes. It is necessary not to copy the European menu, but to create your own, interesting from local seasonal products that you need to love and appreciate.

Today it is very important to preserve the food culture of the Nenets people. The development of the Arctic territories inhabited by indigenous people gradually leads to an expansion of the range of food products, including the use of non-traditional food.

On the potential for development

The development of traditional food culture using modern technologies of cooking food.

To be able to order traditional dishes in restaurants (catering places);

To enable indigenous people to open mobile slaughterhouses that will be used on the routes of the migrations, with the possibility of using traditional methods of slaughtering with the involvement of veterinary specialists.

Consider the possibility of re-introducing waste-free use of reindeer and production of reindeer offal.

On the label of products produced in the territory of Yamal, except for the Russian language, use the languages of the indigenous peoples of Yamal.

Publishing a culinary book of traditional dishes, which must be modernized. It must be also published in the Internet as a recipe e-book.

Conducting master classes for the cooking and serving of traditional dishes.

Dissemination of information about reindeer husbandry among young people.

Conducting educational courses, lectures, seminars on reindeer herding among reindeer youth with the involvement of reindeer herders from other countries.

Exchange of experience of reindeer herders - veterans and young people in cooperation with other regions of Russia and abroad.

Studying the history of the wild plants use by indigenous peoples as medicines (traditional medicine)

3.4.7 The challenges facing a reindeer herding entrepreneur

Máret Rávdná Buljo, reindeer herder, handicrafter, manager of the enterprise Boazovázzi Goahti AS, lecturer, Sámi resource chef, mother, and wife.

To start an activity in order to add value based on reindeer herding is a big dream for many persons, especially when also considering the needs in regard to the society and world economy. Everything is calculated in money and profitability on paper. Today reindeer herding is facing big challenges in all fields in the world, where everyone contests for the reindeer pastures.

Reindeer herders have learned from ancient time to think sustainability in all parts of their life; in the food eaten, in hunting, in shaping of the structure of a herd, in clothes used, in places where migrating, and so on.

New times have arrived, influenced by new thoughts, new food, clothes, overconsumption, easy life, and demands from the outside world. The digital world, education systems, media, research, laws and decisions from authorities add to this. All Sámi reindeer herders had to adapt themselves to the new time; our families, reindeer herding, way of handling reindeer, teaching, handicraft, and food. Women and young reindeer herders have taken higher education and vanished from the everyday work in reindeer herding. In the mainstream society in the new world, the Sámi knowledge is strangled. In this way, reindeer herding is tied and restricted, forced to change so many ways of doing things that have worked for thousands of years.

When someone wants to start business, many changes arise often in the everyday work of reindeer herding. One has to start prioritize in a different way. Then it is more paper work, marketing, meetings, and you have to reduce you own participation in reindeer herding during the period when it is needed in order to promote and develop your business.

The first challenge is when economical internal disagreement arises, practical work has to be changed, and use of time. The state policy has worked very well in regard to adapting the number of reindeer, which has led to quarrels also between families on the number of reindeer, and even threats between persons if you would want to do reindeer herding in a different way. The state policy has forced people to vanish from the Sámi concept of *siida*. It is thus difficult to dare to develop a reindeer herding business in order to keep your own place and affiliation in the reindeer work. Many reindeer herders do not have so much time to sit and write business plans and applications, so you have to get help from experts. Then you very often face ignorance, derision and other matters that creates discomfort. The assimilation is a huge hindrance. State laws and regulations have not taken into account the Sámi livelihoods and knowledge. To investigate and adapt to these laws and regulations at the same time when applying for funding etc., takes time and energy - it is easy to give up. And, when consulting with the municipality and financers, and when following training courses, then often you face that your business does not fit into any concept: “...such businesses are not defined, you

cannot register anything in the name of reindeer herding, there are separate rules and enterprise codes for such businesses, and so on.” This make you give up!

When you then announce your business publicly, and you should start making money, then it is difficult if anything is new and unknown; to get customers to try, buy and believe, and to market your own goods. Others might be envious, ignorant and even lie in order to stop you from succeeding. This bad culture is inside both the Sámi and the mainstream society. Then it is very important to put your focus on such environments that believe in and lift up your activity. But, if you do develop and succeed very well, then there are other obstacles. For example that local people do not buy your products to prevent you from making any money, or others start competing with the same products. And when you need to find employees and teach them your business, there are huge challenges because traditional indigenous knowledge is lost, ignored and restrained by the mainstream society. And so you also need to strengthen your employees in order to get them to lift up your concept, to believe in your goods and market your business.

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3.4.8 Governance of reindeer herding

PhD Kathrine Ivsett Johnsen, GRID Arendal

For more than a century, the Norwegian state has been concerned that there are ‘too many reindeer’ and ‘too many herders’ in West Finnmark. The state has therefore used regulations and incentives since the late 1970s to rationalise Sámi reindeer husbandry and make it sustainable – mainly through measures to destock the reindeer herds.

Although the rationalisation policies have been in place for 40 years, government officials state that this objective has not been met. West Finnmark has specifically been identified as a region where herding practices continue to be unsustainable. At the same time, the region faces an increasing competition for the land and its resources. There are currently a number of land-use conflicts between reindeer herders and other interests such as mining, wind power and hydropower installations, and roads and other types of urban development. However, government officials and reindeer herders interpret the needs and challenges of reindeer husbandry very differently and the two actors hold competing narratives about the process and consequences of decision-making related to the destocking and land-use in West Finnmark (Johnsen, 2016b, 2018). The government officials claim that the conflicts stem from irrational and backward behaviour of the Sámi herders, and herders claim that the government officials controlling and ignorant of Sámi reindeer husbandry (Johnsen et al., 2015). While the government officials’ narrative is perceived as objective and rational by society at large, the herders’ counternarrative is seen as subjective and opportunistic. The discursive power held by the government officials legitimizes their presentation. Their narrative is repeated in Parliament and by the media and in society; the counternarrative is almost invisible in the public debate. Moreover, the persistence of the dominant narrative have established an undisputed *truth* about Sámi reindeer herders – that is, the herders are overstocking the tundra to maximise their personal benefits and reindeer husbandry is a bottleneck for the economic development of Finnmark (Johnsen et al., 2015; Johnsen, 2016a).

The basis of the two narratives about the process and consequences of decision-making related to the destocking and land-use is the actors’ perception of what reindeer husbandry *is* and *ought* to be. These perceptions are informed by the actors’ experiences, knowledge systems and values. Johnsen et al. (2017) find that the state governance regime for reindeer husbandry promotes practices based on a Western worldview, while it undermines the traditional herding practices and worldview. However, despite 40 years of politics to rationalize reindeer husbandry, a Sámi worldview still continues to influence the reindeer owners’ understanding of the relationship between humans, reindeer and nature, and how this relationship should be managed. However, the state governance skews the power relationship between the state and the reindeer herders to the benefit of the state, it creates winners and losers within the Sámi herding community, and it challenges the herders’ identity and rights to engage in reindeer husbandry.

While the Reindeer Husbandry Act states that reindeer husbandry should be based on Sámi culture, tradition and custom, Sámi traditional herding knowledge and institutions are not recognized in the practical implementation of the Act (Johnsen & Benjaminsen, 2017; Johnsen et al., 2017). The asymmetrical power relations and the competing knowledge systems between herders and government officials make it difficult for the herders to influence decision-making processes that affect their livelihood. Sámi possibility to engage in reindeer husbandry has become dependent on their ability in adapting to a 'Norwegianised' reindeer husbandry (Johnsen et al., 2017).

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3.4.9 Interaction between Arctic Indigenous societies and science institutions

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International Centre for Reindeer Husbandry (ICR) is responsible for Work Package #9 in the INTERACT project, together with a range of partners. INTERACT is an infrastructure project under the auspices of SCANNET, a circumarctic network of currently 83 terrestrial field bases in northern Europe, Russia, US, Canada, Greenland, Iceland, the Faroe Islands and Scotland as well as stations in northern alpine areas. INTERACT specifically seeks to build capacity for research and monitoring in the European Arctic and beyond, and is offering access to numerous research stations through its *Transnational Access* program. This EU Horizon 2020 project has a main objective to build capacity for identifying, understanding, predicting and responding to diverse environmental changes throughout the wide environmental and land-use envelopes of the Arctic. This is necessary because the Arctic is so vast and so sparsely populated that environmental observing capacity is limited compared to most other latitudes.

In INTERACT WP9, we aim to identify best practices for indigenous communities, station managers and researchers to work together to identify drivers of environmental change that require adaptation, and to develop a standardized process based on contrasting case studies that can be generally applied to local communities in the vicinity of research stations. A guidebook for research station managers and local and indigenous communities will be written, to develop a deeper mutual understanding of how to work together to build integrated local observation systems, enabling local communities to better understand and respond to the challenges of present and predicted environmental change.

We will seek to include monitoring of natural resources, like indigenous peoples' food systems into the guidebook, based on indigenous peoples' traditional knowledge to increase the cooperation with researchers and indigenous peoples as part of our food related programs.

ICR has developed Ethical Guidelines which recognizes traditional knowledge as having equal value to scientific knowledge and it also notes the need for new guidelines; "TK is more than a source of empire for researchers. TK carriers shall play a central part in shaping projects and shall be involved as equal partners in consultation and decision-making." These guidelines support the need for creating such a guidelines where scientific community and local community meet and where their knowledge plays an equal role and can develop their cooperation. We will subsequently develop new guidelines including Arctic indigenous peoples' food systems.

Relevant to the topic, the Jåhkåmåhkke Declaration on the occasion of the 6th World Reindeer Herders' Congress in Sweden in August 2017 states:

*“...**Acknowledge** positive contributions of scientists and national research and educational institutions to world reindeer herding, while at the same time **underline** the need for sustainable science, that is building relevant knowledge and capacity in local societies, as opposed to research driven merely by institutional economic agendas, individual career goals, or research shopping, and **welcome** a Code of Ethics for research in world reindeer herding communities.”*

This goes to show the needs from indigenous nomadic peoples for improved interaction and contact.

Based on the further development of the Arctic Science Cooperation Agreement (2017), and the outcome of the recent 2nd Arctic Science Ministerial Meeting in Berlin, there is a strong need for new guidelines on how researchers should operate in indigenous peoples' territory and how the cooperation between the researchers and the local communities could be developed. Information sharing between the researcher community and the local community would benefit both. This is built on the principle on mutual and equal knowledge sharing. One way to achieve better cooperation between researchers, indigenous peoples, local people and decision makers is to provoke thoughtful dialogue among them. A step in this direction is to develop the envisioned inspirational guidebook.



Photo by Yuri Kokovin
