

UiA PRIFORSK Evaluation Form

(Completed by Prof Susan Prescott in assessment of the
Priority Research Centre for Lifecourse Nutrition (PRC-LN))

Assessment guidelines:

The research centre to be reviewed has been a Priority Research Centre (PRIFORSK) at the University of Agder since 2019. From 2019 until the end of 2023, the research centre has been receiving strategic funding from the university in order to further develop and strengthen quality of the centre's research and the centre's national and international impact. The purpose of the current evaluation is to critically assess the centre's achievements in this period, its current level, and the centre's future potential. The assessment will be used as guidance for the university management's decision on whether to extend its funding support to the centre for an additional period of three years.

1. Organization

Appropriateness of the centre's formal organization and organization of research activities

It is clear that the Priority Research Centre for Lifecourse Nutrition (PRC-LN) maintains carefully structured organization, one that appears to be well-matched to the goals of the research activities. The formal organization of PRC-LN, as depicted in Figure 1, appears to favor a horizontal approach to management, one that prioritizes a shared culture of research excellence, through team building and shared values. At the same time, the responsible supervisors within the management team are clearly identified, and it is obvious that the identified leadership has more than adequate relevant experience; moreover, experienced researchers are valued and placed in positions to foster student and early-career development among the teams. The organizational structure includes critical input from strategic advisors, and since the topic of nutrition is of relevance to multiple branches of science and medicine, the Scientific Advisory Board emphasizes interdisciplinary input. Of critical importance is the PRC-LN's emphasis on stakeholder input; the User Advisory Board provides an opportunity for parents, children, and members of various groups to help shape research efforts.

Robustness of the centre, considering the number of participating researchers, their degree of participation and level of competence

Table 7 of the PRC-LN Evaluation Report reflects a robust research Centre with participants from remarkably diverse areas of expertise. The majority of the participants devote significant amounts of time (40% or more) to the PRC-LN, indicating that the operations are not restricted to one or two persons; given the multidisciplinary nature of nutrition, this diversity of expertise, both past and present, ranging from psychology and education to public health and social anthropology, is an indication of a healthy team.

How internal strategic funds and recruitment positions have been used, and its relevance and contribution to the centre's research activities

Proper management and disposition of internal strategic funds is essential to the long-term health of the PRC-LN. Given the success of the PRC-LN to date, it appears that the annual 2.000.000 NOK from the University board and the 500.000 NOK in strategic funding from the Faculty of Health and Sport Science has been used wisely; beyond coverage of the leadership positions, the PRC-LN has prioritized future thinking through strategic investments, being mindful of sustainability of the funds, and recruitment/hires of key personnel such as research assistants. It is clear that the PRC-LN leadership has understood that

funding must be matched to best practices for the Centre's research activities and goal attainment; the PRC-LN is not rigid in its approach and acknowledges that there must be some flexibility on projects, highlighting that additional research time on specific endeavors is a worthwhile investment.

The centre's engagement in supervision of master students and PhD candidates

Table 8 of the PRC-LN Evaluation Report, listing the ongoing and completed PhDs, demonstrates that the Centre prioritizes student success. From 2019 to 2022 the Centre has had eight students complete PhD theses, with an additional two students in the process of submitting completed theses in Spring 2023. Three students have entered maternal and/or paternal leave. Six students who have started between 2021-22 are now on the path toward a PhD. In addition to the PhD portal, the Centre, as of spring 2023, will have supervised 53 students to the completion of a master's degree. Taken as a whole, there appears to be close supervision of students, and based on the Centre's pathway to research excellence graphically depicted in Figure 2., it is clear that students are immersed in an academic culture where research and writing skills are developed in a supportive environment.

The relevance of the centre's external partners to its research activities and research strategy

The PRC-LN has clearly taken steps to engage with public and private sector stakeholders. Beyond its User Advisory Board, the Centre has also established formal collaborations on various projects. The details of these formal collaborations are not immediately clear, although the PRC-LN has established a grading system for its collaborations based on the perceived quality and quantity (time devoted) of the collaboration. To date, the PRC-LN has collaborated with 23 universities, of which the majority are rated as "high". Since investment in collaboration typically saves time and funds, while at the same time increasing the odds of breakthroughs of value to society, a more detailed analysis of collaborations (including outcomes) would be welcome.

2. Scientific excellence and impact

A critical assessment of what the centre itself considers are its jointly achieved and most significant contributions to advancing the research frontier, paying particular attention to a) the significance of the research contributions, and b) whether the contributions could or could not have been achieved by the individual researchers in ordinary research settings

In the PRC-LN Evaluation Report, the authors note the ongoing debate concerning the far-reaching benefits of scientific endeavors, and whether or not traditional criteria such as journal Impact Factor and number of citations are adequate measurements. This is an important consideration. For example, one of the more recent publications from the Centre (Vejrup, et al. Diet in Early Life Is Related to Child Mental Health and Personality at 8 Years: Findings from the Norwegian Mother, Father and Child Cohort Study (MoBa) Nutrients. 2023 Jan 3;15(1):243) was published in the journal Nutrients in January, 2023. Nutrients has a respectable +5 Impact Factor, but is well shy of the top 10 Impact Factor journal Nature Medicine (Impact Factor over 80). Yet, the PRC-LN's Nutrients paper has over 1000 more accesses (surrogate marker of reads) than an original article (Parry, E.M., Leshchiner, I., Guièze, R. et al. Evolutionary history of transformation from chronic lymphocytic leukemia to Richter syndrome. Nat Med 29, 158–169 (2023)) published in Nature Medicine around the same time. The Centre's Vejrup paper was forwarded to me by several different groups of international collaborators, all of whom understood the transdisciplinary and transgenerational implications of the paper. At the same time, the Centre's team members have published important findings in elite journals such as Science. The point is that PRC-LN's strategic approach to publishing and disseminating the team's work is proving to be effective.

Taken as a whole, there is little question that the PRC-LN is earning a well-deserved international reputation for contributing to the larger body of science in the realm of nutrition and neuropsychiatric health; moreover, having attended multiple international conferences in the area of the Developmental

Origins of Health and Disease (DOHaD), I can say with confidence that the Centre's output has caught the attention of international scientists, clinicians, and others working in the field of DOHaD. The strategic approach of the PRC-LN is one which attempts to identify important associations (with an eye toward factors of causation) and policies and practices that can potentially transform personal and public health in the immediate term. Nutrition Now is an example of the latter. At the same time, the PRC-LN was an early adopter of the planetary health concept and has placed its work in the larger contexts of sustainability, socioeconomic factors and the continuum of health at scales of the individual, communities, and the planet.

It seems unlikely that the vast reach of the PRC-LN output could have been obtained by individual researchers working in traditional settings; rather, it is the critical blend of local efforts and global collaborations that have proven successful. With increased recognition that early life experiences set the stage for untold later-life outcomes, there is lots of room for the PRC-LN to grow and expand its reach even further.

The quality of the centre's research and the centre's research output (please refer to the list of up to ten most important publications with comments as well as statistics on total number of publications)

The PRC-LN Evaluation Report highlights protocol papers (both published in good quality journals) among its Top 10 research outputs. This reflects the openness and transparency of the Centre's approach, allowing its background work, strategic approaches and procedures to be scrutinized by the international scientific community; not all research groups are willing to go through the additional steps of having their protocols analyzed by expert peer-reviewers and the scientific journal readership, yet these additional steps taken by the Centre will pay off in the long run, increasing efficiency and providing additional assurance that the Centre is asking the right questions in the safest and most ethical way.

The protocol papers also increase the odds that the goal of collaboration and stakeholder involvement will be increased. The PRC-LN identified the Vejrup, 2023, paper among its Top 10 – Vejrup paper was addressed by this author above, although it is worth repeating that it is one of the most important papers published in the area of nutritional psychiatry/DOHaD in 2023 (reflected by the high number of page views (over 5,100 to date). Taken as a whole, it is clear to see that the transdisciplinary approach of the Centre is realized in the diverse range of its publications, all of them interrelated. We can see publishing related to nutrition and technology use, education, inequalities, food security, bio-philosophy (entanglement), and cognitive-behavioral aspects of dietary choices and developmental outcomes. The PRC-LN can continue to push its publishing trajectory upward into higher impact journals.

The quality and appropriateness of the centre's communication, dissemination, and exploitation activities

The PRC-LN maintains diverse channels for the dissemination of its work, with a strong emphasis on attending conferences and making direct media contributions. This author can attest to the PRC-LN's high-level engagement at the Nova Institute (Baltimore, MD, USA) special "campfire" conference on ultra-processed foods. Translating the scientific findings of DOHaD to parents and communities is a difficult task, one that needs to continue to grow. It would be helpful to know, much like the collaboration efforts, the extent to which the sheer number of media engagements are resonating with non-scientific stakeholders. This might be a question worthy of research attention (See McKerracher L, Moffat T, Barker M, Williams D, Sloboda DM. Translating the Developmental Origins of Health and Disease concept to improve the nutritional environment for our next generations: a call for a reflexive, positive, multi-level approach. *J Dev Orig Health Dis.* 2019 Aug;10(4):420-428).

3. External funding

The centre's *efforts* to obtain external funding

There seems little doubt that the PRC-LN has made a concerted effort to obtain external funding in order to support their operations. In the last four years the team has submitted an average of >9 external funding proposals per year; in addition, the team has submitted five funding proposals directly to the University of Agder.

The centre's *ability* to obtain external funding

Of these 42 proposals, 13 have been successful. In particular, the significant external support of the Nutrition Now project has allowed this critical research effort to move forward. Appendix I of the PRC-LN Evaluation Report, the Assessment of Grant Applications Submitted to the Research Council of Norway, demonstrates that the quality of the PRC-LN applications is very high. If the grades/comments of the independent referees are any indication of the same exceptional quality of proposals submitted to various external funding bodies, there is every reason to think that lack of attaining external funding is not for reasons under control of the PRC-LN team. The 13 successful proposals demonstrate that the PRC-LN certainly has the ability to obtain external funding, and that a variety of outside groups find the work of the Centre to be compelling. Moreover, the amount of money secured by the PRC-LN team has been sizeable; depending upon the inflation-adjusted value of the Euro, the team has secured over 5 million Euros. External funding has allowed for the inclusion of 7 PhDs.

Overall impression of the quality of research proposals submitted by the centre (please refer to the attached assessments of submitted proposals)

In sum, the PRC-LN has proven that it works diligently to survey opportunities for external funding, and has now proven that it has the ability to obtain significant funding, almost certainly aided by work assessments deemed to be high quality. With this convincing track record in place, it would seem that the PRC-LN is well-positioned to secure even larger amounts of external funding.

4. Strategy and plans for further development

It is obvious from the first four years of its existence that the PRC-LN has been operating with a strategic mindset that emphasizes both short and long-term goals. All of the work to this point has allowed the PRC-LN to look toward next steps from a realistic vantage point. The strategic plans include scaling up existing work; part of this vision is translation science and meaningful implementation of effective (evidence-informed) policies and practices. The PRC-LN team note that they will be placing strong emphasis on examining diet and mental health links; this is particularly timely as the international research connecting dietary quality and mental health grows increasingly robust, it will place the PRC-LN at the front of an exciting area of scientific discovery. One area that should offer new opportunities for collaboration and stakeholder engagement is the PRC-LN's planned Urban Lab; this is an exciting vision that will, if implemented as described, allow for the local testing of ideas and interventions.

Through its input from stakeholders through the User Advisory Board, the PRC-LN has valued the input of individuals and groups who can help the team understand whether or not they are asking the right questions, in the right way (meaning, that the questions being asked in research and implementation efforts are those that have the potential to create meaningful change). The Urban Lab is a large-scale expansion of the bi-directional trust built up with stakeholders.

Based on the existing track record, there is every reason to think that the PRC-LN will develop an Urban Lab that will be modeled by international research groups and their own communities. Taken as a whole, the Beyond-2022 strategic plan of the PRC-LN is of high quality and is a natural expansion of the well-established strengths of the Centre. The Urban Lab will be a significant effort and will likely absorb a considerable amount of resources; however, this major goal is feasible and well within the expertise of an adequately-funded PRC-LN.

5. Overall assessment and future potential

Based on your reading of the evaluation report and assessment of the abovementioned criteria, the overall assessment should comment on, but is not limited to:

Overall impression of the centre's ability to strengthen and increase research quality and research capacity in the period of evaluation (2019-mid 2023)

It is the opinion of this reviewer that the PRC-LN has demonstrated a clear ability to organize and manage a multi-million Euro research endeavor with excellence. The Centre has published ground-breaking research that is relevant to multiple disciplines within science, medicine, public health; the research outputs are of special interest to the developmental origins of health and disease, and the social determinants of disease; from 2019 through mid-2023, the Centre has placed Norway as an international leader in the emerging realm of diet-mental/neuropsychiatric research. All the while, the PRC-LN has obviously dedicated itself to graduate student development and early-career research development.

Overall impression of the centre's research quality and competitiveness at an international level as of mid 2023

The Centre has shown a desire to strengthen its research quality, and increase its output. The willingness of the PRC-LN to publish its research protocols shows that it is willing to have its plans and designs scrutinized with an aim toward improving the outcomes. My own experience with encountering the work of the PRC-LN speaks to the increasing international profile of the group from 2019 through mid-2023. The Centre's projects are not only demonstrating a keen ability to stay competitive with international research, efforts such as Nutrition Now are at the forefront of early-life nutritional interventions, demonstrating collaborative possibilities for other international groups to follow.

Overall impression of the centre's future potential

There should be very high expectations for the future of the PRC-LN; investments made into the Centre have clearly paid dividends already, and the strategic plans have demonstrated wisdom in attaining short- and longer-term goals. The next phase of PRC-LN activity, beyond 2023, especially the plans for the Urban Lab, will be of benefit to Norway, the global scientific community, and society at-large.

Thank you for this opportunity to review the Priority Research Centre for Lifecourse Nutrition (PRC-LN). Please contact me if any further information is required.

A handwritten signature in blue ink that reads "Susan Prescott". The signature is written in a cursive style with a long horizontal stroke at the end.

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