



# Pregnant Women's Autonomy in Consuming Animal-Source Protein and Local Lactogogue Foods for Stunting Prevention in Seluma, Indonesia: A Qualitative Study

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**Abstract. Background:** Stunting remains a major public health problem in Indonesia and requires prevention starting from pregnancy. Although stunting prevalence in Seluma District, Bengkulu Province, has declined, it has not yet reached the national target of 14% by 2025. Strengthening pregnant women's autonomy in meeting nutritional needs particularly consumption of animal-source protein and local lactogogue foods is essential but remains limited. **Objective:** This study aimed to describe pregnant women's autonomy in consuming animal-source protein and local lactogogue foods for stunting prevention, viewed through empowerment theory and Nola J. Pender's Health Promotion Model. **Methods:** A qualitative descriptive study was conducted using purposive sampling. In-depth interviews were carried out with 13 pregnant women, supported by community health cadres, midwives, nutrition officers, and mothers of stunted toddlers. Data were analyzed using qualitative content analysis. **Results:** Pregnant women demonstrated limited nutrition knowledge and skills related to protein sources and food processing. Economic constraints and household food prioritization reduced consumption of animal-source protein, despite relatively adequate decision-making autonomy. **Conclusion:** Pregnant women's nutritional autonomy remains limited at the behavioral level. Empowerment-based, family-involved nutrition interventions are needed to support sustainable maternal nutrition and early stunting prevention.

**Keywords:** Pregnant women's autonomy; animal-source protein; lactogogue foods; stunting prevention

## 1 Introduction

Poor dietary practices during pregnancy are strongly associated with the health of pregnant women and fetal development, and may continue to affect the child after birth,

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increasing the risk of stunting [1]. Evidence shows that maternal undernutrition contributes to approximately 20% of stunting cases. Inadequate nutritional intake during pregnancy is linked to impaired fetal growth and development, and increases the likelihood of delivering infants with low birth weight (LBW). LBW is a major predictor of stunting; infants born weighing <2500 grams have a significantly higher risk of becoming stunted [1]. Insufficient dietary intake during pregnancy also contributes to maternal malnutrition, which adversely affects newborn outcomes. Adequate maternal nutrition supports optimal gestational weight gain, reduces preterm birth, and improves birth weight. The World Health Organization (WHO) recommends increased intake of energy, vitamins, and minerals through adequate consumption of macro- and micronutrients during pregnancy [2].

Stunting remains a major public health problem in Indonesia and reflects chronic malnutrition, recurrent infections, and inadequate care beginning as early as pregnancy. According to the 2023 Indonesia Health Survey (Survei Kesehatan Indonesia/SKI), the national prevalence of stunting reached 21.5%, indicating only modest progress in recent years. Stunting develops primarily within the first 1,000 days of life, and maternal nutritional intake during pregnancy particularly adequate consumption of high-quality protein is a key determinant of fetal growth and development [3]. Children who are stunted face long-term consequences, including impaired cognitive development, increased susceptibility to illness, and reduced productivity in adulthood. Macro and micronutrient deficiencies among pregnant women are strongly associated with poor fetal growth, LBW, and early stunting.

Animal-source proteins, including eggs, meat, poultry, fish, and dairy products, provide high biological value protein with complete essential amino acids, high digestibility as well as iron, zinc, and vitamin B12, which are critical for placental development, fetal cell formation, and growth-related hormonal processes. Global evidence demonstrates that adequate animal source protein intake among pregnant women reduces the risk of intrauterine growth restriction (IUGR), LBW, and early stunting [4]. However, in many regions of Indonesia, animal-source protein consumption remains lower than plant-based protein intake due to economic constraints, dietary habits, and limited nutritional knowledge. This situation is also evident in Seluma District, despite the availability of local animal-protein sources such as eggs, chicken, marine and freshwater fish, shrimp, snails, and meat.

Several national and local studies indicate that pregnant women's consumption of animal-source protein in Indonesia remains insufficient, particularly among low socio-economic-status households. The 2018 Basic Health Research (RISKESDAS) reported that more than 35% of pregnant women did not meet the recommended daily protein intake. Community-based studies in Seluma District reveal similarly low levels of animal protein consumption, including very limited intake of meat, milk, and eggs. A local study reported that 83.2% of pregnant women in Seluma did not meet adequate protein intake and 93.5% had low total protein levels [5]. Furthermore, 73.8% of pregnant women lived in households with income below the regional minimum wage, 76.6% were unemployed, and more than half lived in large households. High parity and chronic energy deficiency further increased household food demands, making it more difficult to meet nutritional requirements. Supporting these findings, the 2023 Central

Bureau of Statistics (BPS) report indicated that Seluma has the highest poverty rate in Bengkulu Province (18%), with a low per capita income a per capita income of only IDR 444,931. These socio economic conditions directly affect the purchasing power for protein rich foods.

In addition to animal source protein intake, the utilization of local foods as lactogogues plays an important role in maternal health and breastfeeding success, which indirectly contributes to stunting prevention. Local food ingredients such as katuk leaves, moringa leaves, unripe papaya, banana blossom, and sweet potato leaves have long been used in Indonesian communities as galactagogues. Several studies have confirmed their potential to support breast milk production and maternal nutritional status [6][7]. Promoting the use of locally available lactogogue foods may strengthen household food security and enhance maternal nutritional autonomy.

Importantly, nutritional practices during pregnancy are not determined by food availability alone but are strongly influenced by women's autonomy in dietary decision-making. In this study, autonomy refers to a woman's capacity to access nutrition-related information, make informed decisions, and act on those decisions within household and sociocultural constraints. In many rural Indonesian contexts, food choices are shaped by economic limitations, food taboos, family hierarchies, and the influence of husbands and extended family members, which may limit pregnant women's ability to prioritize their own nutritional needs.

To examine these behavioral and contextual dimensions, this study draws on Self-Determination Theory (SDT) and Nola J. Pender's Health Promotion Model (HPM). SDT conceptualizes autonomy, competence, and relatedness as key psychological needs that influence motivation and behavior, while HPM emphasizes perceived benefits and barriers, self-efficacy, and interpersonal influences in health-related decision making [10,11]. Integrating these frameworks allows for a more systematic exploration of how individual motivation, social support, and structural constraints interact to shape pregnant women's nutritional autonomy.

Previous studies on stunting prevention in Indonesia have largely focused on quantitative assessments of nutrient intake and program coverage, with limited attention to women's lived experiences, decision-making processes, and local food contexts. Qualitative evidence exploring pregnant women's autonomy in consuming animal-source protein and local lactogogue foods in rural settings such as Seluma District remains scarce. Therefore, this study aims to describe pregnant women's autonomy in fulfilling animal-source protein and local lactogogue food consumption during pregnancy, viewed through the lens of empowerment theory and Nola J. Pender's Health Promotion Model, to inform more context-sensitive stunting prevention strategies. This study contributes novel insights by integrating behavioral theory with local food contexts to explain maternal nutrition autonomy in a rural Indonesian setting.

## 2 Methods

This study employed a qualitative descriptive design to explore pregnant women's autonomy in consuming animal-source protein and local lactogogue foods. A qualitative

approach was chosen to capture participants' experiences, perceptions, and decision-making processes in depth. The study was conducted in Seluma District, Bengkulu Province, Indonesia. Seluma is a predominantly rural area where most households rely on agriculture and informal employment, and access to diverse animal source foods varies across communities. Data collection took place in selected villages within the working areas of community health centers.

Participants were selected using purposive sampling to ensure information rich cases. The main informants were 13 pregnant women who met the inclusion criteria: residing in Seluma District, currently pregnant, and willing to participate in the study. Supporting informants included two community health cadres, two midwives, two nutrition officers, and two mothers of stunted toddlers, who provided contextual and triangulation data. Recruitment continued until data saturation was reached, indicated by the repetition of themes and no emergence of new information.

Data were collected through in-depth, semi-structured interviews and field observations. Interviews were conducted in the local language or Indonesian, depending on participant preference, and lasted approximately 30–60 minutes. An interview guide was developed based on empowerment theory, Self-Determination Theory, and Nola J. Pender's Health Promotion Model, covering topics such as knowledge of nutrition, decision-making autonomy, family influence, economic considerations, skills in processing local foods, and perceptions related to protein consumption. All interviews were audio-recorded with participants' consent and transcribed verbatim.

To enhance the credibility and trustworthiness of the findings, several strategies were employed. Data triangulation was achieved by comparing information from different types of informants. Peer debriefing was conducted among the research team to discuss emerging themes. An audit trail was maintained to document analytic decisions throughout the research process.

The study adhered to ethical principles for research involving human participants. Ethical approval was obtained from the relevant institutional ethics committee. All participants received information about the study objectives and procedures and provided informed consent prior to participation. Confidentiality and anonymity were ensured by removing identifying information from transcripts and reports.

### 3 Results

Interviews with pregnant women, cadres, midwives, and nutrition officers revealed five major themes: knowledge, motivation, commitment, social support, and autonomy. Below is the summary of themes, main categories, and subcategories:

**Table 1.** Themes, Key Themes, Categories, and Representative Quotations

| Theme            | Category  | Key Findings   | Representative Quotations   |
|------------------|---|--|---|
| <b>Cognition</b> | Knowledge of protein, lactogogues, and stunting | Most mothers lacked basic understanding of animal-source | "Protein? I don't know what it is or the types." (Pregnant woman, P5) |

| Theme          | Category                      | Key Findings  | Representative Quotations  |
|----------------|-------------------------------|---|--|
| Motivation     | Perceived benefits & barriers | protein, lactogogues, and stunting prevention<br>Mothers did not fully recognize the benefits of animal protein for pregnancy; cost perceived as main barrier | “If there are only two pieces of fish, I give them to my husband and children.” (P8) |
|                | Competence needs              | Some mothers sought information, but many lacked confidence and skills  | “I’m not confident in my knowledge and skills to cook protein foods.” (P10)          |
|                | Relatedness needs             | Motivation increased with encouragement and reminders from family   | “My husband reminds me to eat nutritious food and fish.” (P2)                        |
| Commitment     | Autonomy needs                | Food choices limited by low income and dependence on others   | “Eating fish or eggs every day is too expensive.” (P1)                               |
|                | Intention to act              | Mothers intended to consume animal protein but could not sustain it   | “If the price is high, I can’t buy it.” (P13)  |
| Social Support | Strategy & joint action       | Limited participation in antenatal classes due to access barriers   | “No class here, only at the health center, which is far.” (P11)                      |
|                | Spousal & family support      | Husbands provided reminders but rarely prepared or budgeted for protein   | “Mostly, husbands remind but don’t prepare the food.” (Midwife 1)                    |
|                | Cadre & health worker support | Counseling was general and not theory-based   | “Counseling is general; we haven’t applied SDT or HPM.” (Midwife 1)                  |
| Autonomy       | Cognitive autonomy            | Decision-making influenced by myths and social norms  | “There are myths—eggs cause boils, eel is not allowed.” (P6)                         |
|                | Intellectual autonomy         | Limited skills in diversified food processing   | “We only fry or stew; no training yet.” (P12)  |
|                | Behavioral autonomy           | Inadequate intake and inconsistent consumption patterns   | “We have chickens, but we sell them instead of eating them.” (P7)                    |

### 3.1 Cognition (Knowledge)

**Understanding of Protein, Lactogogum, and Stunting.** A total of 69.2% of pregnant women lacked basic knowledge regarding types of animal-source and plant-based proteins, the benefits of animal-source protein during pregnancy, the role of lactogogum, and the relationship between protein intake and stunting prevention. Many mothers were also unfamiliar with cooking techniques needed to prepare diverse local dishes.

**Perceived Benefits and Barriers.** Most pregnant women had limited understanding of the benefits of consuming animal-source protein and lactogogum for fetal growth and

stunting prevention. Several mothers even asked the interviewer to explain what stunting meant. Mothers tended to prioritize husbands and children in consuming animal-source foods. Economic hardship emerged as a major barrier. Although not all mothers explicitly stated living in poverty, field observations showed many came from low-income households with limited resources, especially those experiencing chronic energy deficiency (CED). Many pregnant women had low educational backgrounds and married at a young age due to unplanned pregnancies.

### 3.2 Motivation

**Competence Needs.** Some pregnant women actively sought information and tried to prevent stunting by learning about nutritious foods. However, others were less motivated due to childcare duties, lack of transportation, or husbands working long hours.

Health workers also reported that some mothers living in remote plantation areas rarely attended antenatal care.

**Relatedness Needs.** Most pregnant women expressed needing reminders to eat nutritious foods and felt happy when praised for consuming protein foods. Mothers also expressed willingness to share information with peers.

**Autonomy Needs.** Mothers with low income (< IDR 2.5 million/month) felt limited freedom to choose protein-rich foods due to high prices.

### 3.3 Commitment

Many pregnant women intended to consume animal-source protein, but financial constraints weakened their commitment.

**Strategy Identification.** Most mothers allocated some time to prepare meals containing animal-source protein or lactogogum-rich vegetables, yet many lacked confidence in their cooking skills.

**Collective Action.** Some mothers joined antenatal classes, while others did not due to distance or lack of transportation.

Mothers expressed strong need for support from spouses, midwives, and cadres.

### 3.4 Social Support

**Support from Husbands.** While some husbands reminded their wives to eat nutritious foods, most were not actively involved in providing or preparing animal-source protein.

**Support from Cadres.** Cadres provided stunting-prevention information but not specifically on protein and lactogogum consumption. They taught cooking verbally but did not demonstrate it, and did not apply the Health Promotion Model (HPM) or Self-Determination Theory (SDT).

**Support from Health Workers.** Health workers and midwives provided routine counseling but acknowledged that motivation counseling based on HPM and SDT had not been applied.

**Support from Village Government.** Village-level programs included supplementary feeding for pregnant women with CED and stunted toddlers, distribution of livestock, and nutrition assistance but implementation varied between villages.

### 3.5 Autonomy

**Cognitive Autonomy (Decision-Making).** Some mothers still struggled to independently decide what protein foods to eat and continued to follow food myths.

**Intellectual Autonomy (Knowledge and Skills).** Most mothers lacked skills in preparing diverse protein dishes and had not received cooking demonstrations.

**Behavioral Autonomy (Action).** Some pregnant women kept small livestock or planted vegetables but sold them rather than consuming them. Most mothers did not meet the recommended 60 g of animal-source protein per meal and struggled to prepare varied local dishes. Food frequency analysis showed mothers consumed: Vegetables & plant protein: 4–6×/week, Eggs: 4–6×/week, Chicken & fish: 2–3×/week, Beef: 1–3×/month, Milk: 1–3×/month.

Overall, autonomy in consuming animal-source protein and lactogogum remained low and requires strengthening through a tailored empowerment model integrating Self-Determination Theory (SDT) and Nola J. Pender's Health Promotion Model (HPM).

**Table 2.** Summary of Key Findings and Theoretical Implications (SDT & HPM)

| Component           | Key Findings  | SDT Interpretation | HPM Interpretation                            | Implications  |
|---------------------|---|--------------------|---|---|
| Nutrition knowledge | 69.2% had low knowledge of protein, stunting, and food processing | Low competence     | Low perceived benefits & self-efficacy        | Competency-based nutrition education & cooking demonstrations |
| Food prioritization | Mothers prioritize husbands/children                              | Low autonomy       | Cultural barriers increase perceived barriers | Family-based nutrition interventions                          |

| Component         | Key Findings                           | SDT Interpretation                 | HPM Interpretation           | Implications                            |
|-------------------|--|------------------------------------|------------------------------|---|
| Cooking skills    | Limited skills & confidence            | Low competence                     | Weak self-efficacy           | Training on local food processing       |
| Social support    | Limited spousal/cadre involvement      | Low relatedness                    | Weak interpersonal influence | Strengthen husband & cadre engagement   |
| Economic barriers | Protein unaffordable                   | External pressure reduces autonomy | High perceived barriers      | Subsidies & village-based food programs |
| Overall autonomy  | Dependence, myths, inconsistent intake | SDT needs unmet                    | Weak commitment to action    | Integrated SDT-HPM empowerment model    |

## 4 Discussion

This study provides a theory informed explanation of the limited autonomy of pregnant women in Seluma District in consuming animal-source protein and local lactogogue foods for stunting prevention. Despite the availability of local food resources and routine nutrition counseling, maternal dietary behavior remains constrained by behavioral and sociocultural factors. By mapping the findings onto Self-Determination Theory (SDT) and Nola J. Pender's Health Promotion Model (HPM), this study moves beyond descriptive nutritional explanations to clarify the mechanisms underlying the persistence of inadequate maternal nutrition.

From the perspective of SDT, the low level of nutritional knowledge observed among 69.2% of participants reflects insufficient competence. Limited understanding of protein sources, benefits, food processing methods, and stunting prevention reduced women's confidence to independently select and prepare animal-source foods. Similar findings have been reported in other low-resource settings, where low maternal nutrition literacy is associated with monotonous diets and inadequate intake of high-quality protein and essential micronutrients [11], [12]. Within the HPM framework, this lack of competence corresponds to low self-efficacy, weakening commitment to dietary change despite awareness of nutritional importance.

Autonomy was further constrained by economic hardship, household decision-making dynamics, and cultural food norms. Although many women expressed intention to improve their diets, high food prices and dependence on husbands for food purchases limited their ability to act on these intentions. Household food allocation practices that prioritize husbands and children over pregnant women reflect entrenched gender norms that reduce women's control over food choices. These conditions function as high perceived barriers in HPM and undermine autonomous motivation as conceptualized in SDT [14], [16].

Food taboos and intergenerational myths also restricted dietary behavior. Beliefs that eggs or certain fish are harmful during pregnancy discouraged consumption of animal-source foods, even in the presence of health education. Such culturally embedded restrictions have been widely documented and often persist despite biomedical advice, indicating that knowledge alone is insufficient to change behavior [18].

Social support emerged as a key enabling factor. Women who received encouragement from husbands, health workers, or community cadres reported greater motivation to consume nutritious foods. In SDT, relatedness strengthens internal motivation, while in HPM, interpersonal influence facilitates commitment to action [10], [23]. However, in this study, support was largely verbal and not accompanied by practical assistance, such as food budgeting, preparation, or problem-solving. This limited the effectiveness of existing nutrition counseling, which remained largely didactic and non-empowering.

The coexistence of low competence, constrained autonomy, and weak relatedness explains the observed intention–behavior gap. Although women expressed willingness to consume animal-source protein, external constraints and low self-efficacy prevented sustained behavior change. SDT posits that behaviors driven by external pressure are unlikely to be maintained, while HPM highlights that high perceived barriers weaken commitment to action [24].

Overall, these findings indicate that maternal nutrition interventions in Seluma should move beyond information-based counseling toward empowerment-oriented strategies. Strengthening practical skills, enhancing women’s decision-making power, improving affordability of local protein sources, and actively involving husbands and community cadres are essential to support sustainable dietary behavior change and stunting prevention beginning in pregnancy. These findings not only support SDT and HPM but also illustrate how structural poverty and gender norms condition the expression of autonomy in low-resource rural settings.

#### **4.1 Limitations**

This study is limited by its qualitative design, small sample size, and focus on a single district, which restrict generalizability. Data were self-reported and may be subject to social desirability bias, and researcher positionality may have influenced interpretation. Nevertheless, the study provides important contextual insights into behavioral and sociocultural determinants of maternal nutrition autonomy in rural Indonesia.

## **5 Conclusion**

This study demonstrates that pregnant women’s autonomy in consuming animal-source protein and local lactogogue foods in Seluma District remains limited and has not yet supported optimal stunting-prevention efforts. Three key findings emerge. First, most pregnant women exhibited low nutritional competence, as reflected in limited knowledge of protein sources, benefits, food processing, and stunting prevention. Second, although many women expressed intention to improve their diets, autonomy in action was constrained by economic hardship, household food allocation practices, and

persistent food taboos, resulting in an intention behavior gap. Third, social support from husbands, community cadres, and health workers was present but insufficiently operationalized to strengthen women's confidence and sustained dietary behavior.

These findings matter because maternal nutrition during pregnancy is a critical determinant of fetal growth and early-life stunting risk. The persistence of low autonomy despite routine antenatal nutrition counseling indicates that information-based approaches alone are inadequate. Viewed through Self-Determination Theory and the Health Promotion Model, the unmet needs for competence, autonomy, and relatedness explain why pregnant women struggle to independently adopt and maintain nutritionally adequate behaviors, even in the presence of local food resources.

To address these gaps, stunting-prevention efforts should adopt empowerment-oriented, context-sensitive strategies. Antenatal care counseling should move beyond generic messages to include practical, skills-based education on affordable animal-source protein and local lactogogue food preparation. Community cadres and midwives should be strengthened to provide participatory and motivational counseling that involves husbands and family members, thereby enhancing social support. In addition, collaboration with village authorities is needed to improve access to affordable local protein sources through initiatives such as community-based food markets, household livestock support, or local food subsidies. Collectively, these approaches can strengthen pregnant women's autonomy and support sustained nutritional behavior change as part of early stunting prevention.

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