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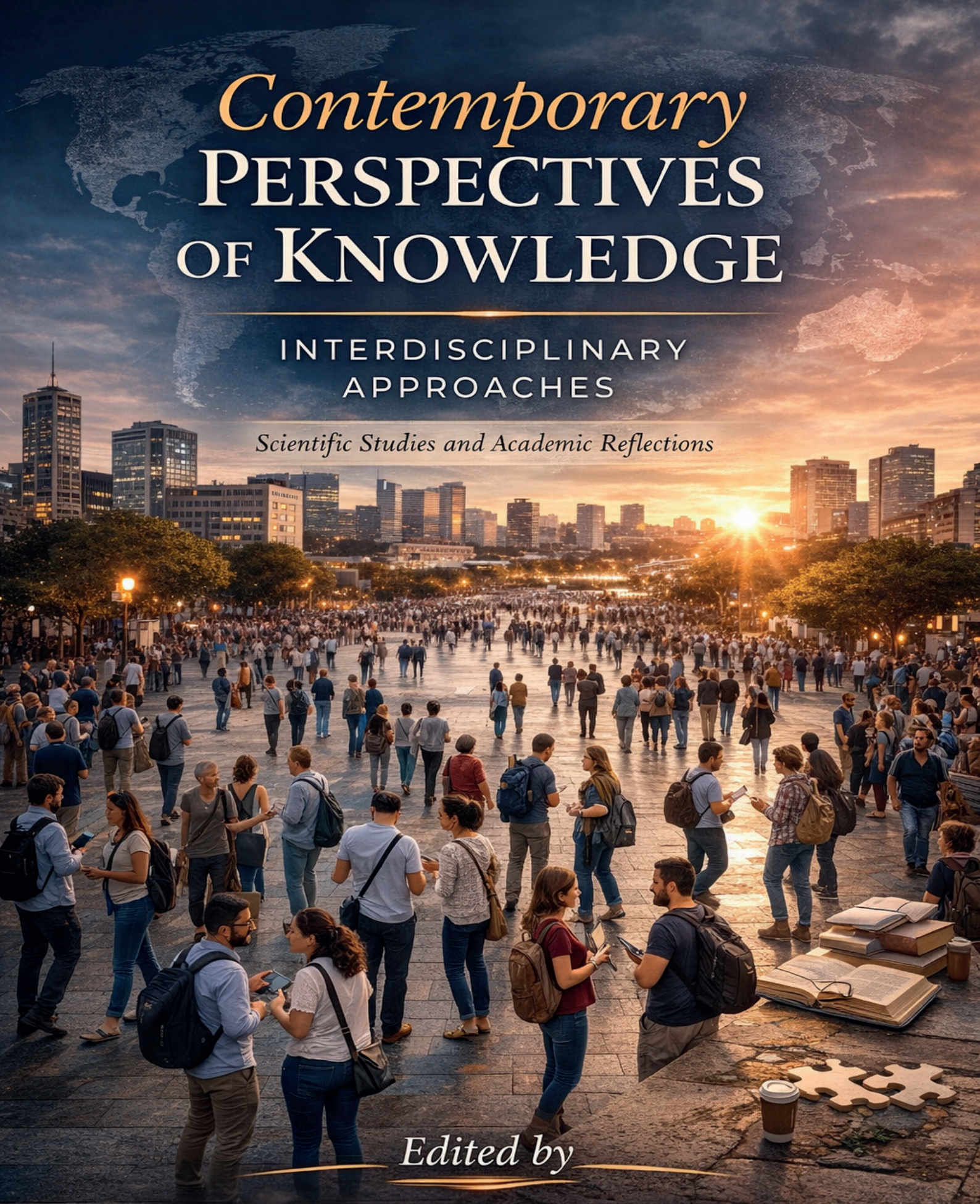

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Chapter 12

THE NUTRITIONIST AS AN AGENT OF TRANSFORMATION: COLLECTIVE HEALTH, DISEASE PREVENTION AND THE FUTURE OF BRAZILIAN CHILDHOOD

THE NUTRITIONIST AS AN AGENT OF TRANSFORMATION: COLLECTIVE HEALTH, DISEASE PREVENTION AND THE FUTURE OF BRAZILIAN CHILDHOOD

> "Tell me what you eat and I will tell you who you are — and, more than that, I will tell you who you will become." — Adapted from Jean Anthelme Brillat-Savarin

Raquel Biagioni Faccina Ortiz[1]

Abstract: This chapter emerges from a deep conviction: nutrition is not merely the science of food — it is the science of the future. Every child who sits at the table of a public or private school today, every school meal served in a courtyard, every guidance given to a family during a consultation, represents a decision that goes far beyond the immediate present. It represents a wager on the type of adult that child will become, on the health they will carry with them, and on the burden — or freedom — they will represent for the country's health system. Throughout my career as a nutritionist — with training spanning microbiology, immunology and social nutrition — I have learned that treating childhood nutrition as a secondary issue is one of the greatest mistakes a nation can make. Chronic non-communicable diseases such as obesity, type 2 diabetes, hypertension and metabolic syndrome — once restricted to the adult universe — are now knocking on the doors of our children with alarming frequency. And most revealing: they arrive silently, shaped by habits built in the first years of life. This chapter invites the reader — whether nutritionist, pediatrician, public administrator, educator or student — to understand the magnitude of this challenge and the urgency of a collective, integrated, and above all, strategic response.

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Keywords: nutritionist; transformation; health

The Window of Opportunity: Why Childhood is the Decisive Moment

The Concept of Early Metabolic Programming

Science leaves no room for doubt: the first thousand days of a child's life — counted from conception to the second birthday — represent the most strategic window for nutritional intervention in an entire human existence (BARKER, 2004). During this period, the developing organism is extraordinarily sensitive to environmental stimuli, and nutrition is the most powerful stimulus of all.

The concept of early metabolic programming, extensively studied by David Barker and consolidated by the DOHaD hypothesis (Developmental Origins of Health and Disease), establishes that nutritional exposures during pregnancy and the first years of life shape gene expression, intestinal microbiota composition, insulin sensitivity and the systemic inflammatory response of the individual for decades (BARKER, 2004). In other words: what the child eats today programs the metabolism they will have tomorrow.

The intersection between nutrition, microbiology and immunology is particularly revealing in this context. It is now known that the colonization of the gastrointestinal tract in the first months of life — directly influenced by breastfeeding, complementary feeding and the use of probiotics — determines the child's immunological profile, their predisposition to chronic inflammatory processes and their ability to regulate body weight throughout life (CRYAN et al., 2019). A well-colonized intestine is, literally, an immunological shield.

The Brazilian Epidemiological Landscape: Data We Cannot Ignore

Brazil faces an unprecedented epidemiological and nutritional transition. We coexist, paradoxically, with the dual spectrum of malnutrition: on one side, children who still suffer from

micronutrient deficiencies such as iron, zinc and vitamin A; on the other, a silent and growing epidemic of childhood overweight and obesity.

Data from the Food and Nutritional Surveillance System (SISVAN) and the National School Health Survey (PeNSE) reveal that approximately 30% of Brazilian children between 5 and 9 years old are overweight, with even more expressive numbers in the South and Southeast regions and among higher-income populations — breaking the myth that obesity is a problem exclusive to the more affluent classes (IBGE, 2020). The reality is more complex and democratically cruel: obesity today affects people regardless of income, though with distinct determinants.

> Impact Data: According to the IBGE, in 2019, 14.7% of children aged 5 to 9 were already obese — not just overweight. This represents almost 3 million children at increased risk of developing type 2 diabetes, hypertension, dyslipidemia and cardiovascular disease even during adolescence (IBGE, 2020).

This scenario is not inevitable. It is consequential. And every consequence has traceable, addressable, modifiable causes. This is precisely where the nutritionist must act — not only in individual clinical practice, but in the systems that produce these numbers.

The Nutritionist Beyond the Clinic: Collective Health as Strategic Vocation

Rethinking the Role of the Nutritionist in Society

For decades, the social imaginary associated the nutritionist with the figure of a professional who designs restrictive diets, advises patients on calories and prescribes supplements. This model — important, legitimate, but insufficient — represents only a fraction of the profession's transformative potential.

Nutrition in collective health operates on a completely different scale. Here, the patient is not an individual: it is a population. The office is not a clinical room: it is a school, a primary health care unit, an industrial kitchen, a public policy. And the prescriptions are not personalized diets: they

are nutritional surveillance protocols, food education programs and decisions about what 47 million students will eat in the next school year.

Understanding this dimension is fundamental for any nutritionist who wishes to practice their profession with fullness and impact. Working in collective health is not less noble than clinical work — it is more urgent, more complex and, in many respects, more transformative.

The Essential Triad: Diagnosis, Intervention and Monitoring

The nutritionist's practice in public health follows a logic that every professional must master: diagnose with precision, intervene with intelligence and monitor with rigor. This triad is not merely methodological — it is ethical.

Collective Nutritional Diagnosis

Monitoring the nutritional status of children in schools and health units is the foundation of any effective strategy. Tools such as WHO growth curves, Body Mass Index for age, height for age and waist circumference are valuable instruments that allow early identification of nutritional deviations before they become established diseases (OMS, 2009).

In Brazil, SISVAN-Web and the instruments of the Household Budget Survey System (IBGE) provide a robust epidemiological basis for planning actions. The tragedy is that this data, when it exists, frequently remains locked in health department offices, without being transformed into concrete action in schools and communities.

Evidence-Based Intervention

An effective collective nutritional intervention must be ecological — that is, it must modify

the food environment, not just individual behavior. It is not enough to teach a child that fruits are better than filled cookies if the only food available in the cafeteria is the cookie. Environmental change must precede — or at least accompany — behavioral change.

This means working with school food managers, PNAE suppliers, cooks and kitchen staff (underestimated protagonists of childhood nutrition), school principals and, fundamentally, with families. Collective nutritional intervention is, by definition, multi-site and multi-actor.

Monitoring and Impact Assessment

Programs without monitoring are assumptions without verification. The nutritionist in collective health must develop competencies in impact assessment, use of health indicators and trend analysis. The question that must guide every intervention is not only 'what did we do?' but 'what changed because of what we did?'

Public School Feeding Policies: PNAE as a Laboratory for Change

The Grandeur and Limits of the National School Feeding Program

The National School Feeding Program (PNAE) is, without exaggeration, one of the largest and most complex school feeding programs in the world. Created in 1955 and consolidated over decades, the program currently serves more than 47 million students in public basic education, with an annual investment exceeding R$ 4 billion (BRASIL, 2020). It is a logistical, nutritional and political operation of continental proportions.

From a nutritional standpoint, the PNAE establishes clear and technically grounded guidelines: menus developed by nutritionists as technical managers, a minimum of 30% of resources dedicated to purchasing food from local family farming, restrictions on the use of ultra-processed foods, and the offering of fruits and vegetables (BRASIL, 2020). On paper, the program is exemplary.

In practice, implementation is heterogeneous, marked by regional inequalities, budgetary limitations, management challenges and, frequently, the absence or fragility of the nutritionist as an active agent in the process.

The Technical Manager Nutritionist: From Technical Responsibility to Transformative Leadership

Brazilian legislation is clear: every school feeding program must have a nutritionist as Technical Manager (RT). But formal presence is not sufficient. What differentiates a mediocre program from a transformative one is the presence of a nutritionist who goes beyond menu development and assumes a role of educational leadership, political articulation and cultural change agent.

In my experience consulting in schools — both private and public — I have learned that the most impactful programs are those in which the nutritionist stops being a technical service provider and becomes a strategic partner of school management. This involves participating in pedagogical meetings, training teachers on healthy eating, engaging families in workshops, monitoring students' nutritional data and reporting to school leadership with impact indicators.

This posture — which I call strategic nutrition — transforms the school into a space of active health promotion, not just curricular instruction.

> Author's Reflection: The school is the only space in a child's life where we can have, with relative regularity and consistency, simultaneous influence over what they eat, what they learn about nutrition and how they move. Wasting this space is a public health tragedy that begins silently and ends in statistics of premature mortality.

Private Schools and the Social Responsibility That Cannot Be Neglected

It is a mistake to think that healthy school nutrition is an issue restricted to public schools.

Private schools — which serve higher-income populations, but who are not immune to ultra-processed food consumption and inadequate dietary patterns — have a peculiar responsibility: they are frequently trend-setters and role models.

Nutritional consulting in private schools represents a strategic opportunity not only for those children, but for the entire community. When a private school implements a rigorous healthy eating program, it shapes families who take that knowledge home, who demand improvements in their cities' food services and who eventually become opinion leaders on public health policies.

Public health is built also — and perhaps especially — in spaces of cultural and social influence. Neglecting nutrition in private schools means losing a powerful vector of systemic change.

The Prevention Triad: Microbiome, Immunity and Nutrition in Childhood

The Intestine as the Primary Immunological Organ

One of the most revolutionary contributions of science in the past twenty years has been to reveal the depth of the connection between the intestine, the immune system and the brain (CRYAN et al., 2019). The intestinal microbiome — the set of trillions of microorganisms that inhabit our gastrointestinal tract — is not a passenger of the organism: it is a co-regent of fundamental functions, from digestion to mood modulation, from vitamin synthesis to adaptive immune response.

In children, this dimension is even more critical. Intestinal colonization begins at birth (or, according to more recent evidence, still in the womb) and is profoundly shaped by the first foods the child receives. Exclusive breastfeeding in the first six months of life — recommended by the WHO and the Brazilian Ministry of Health — is not just a source of nutrients: it is a vehicle of protective bacteria, natural prebiotics (human milk oligosaccharides) and immunoglobulins that structure the child's initial microbiome (VICTORA et al., 2016).

Complementary feeding — ideally initiated at 6 months, with fresh and minimally processed foods, according to the Dietary Guidelines for Brazilian Children Under 2 Years of the Ministry

of Health (BRASIL, 2019) — represents the second major moment of microbiome modeling. Each food introduced is also an inoculation of substrates that feed specific bacterial colonies, with direct implications for the child's immunological, metabolic and neurological health.

Low-Grade Chronic Inflammation: The Silent Enemy

One of the central mechanisms connecting poor nutrition and chronic diseases in childhood is low-grade chronic inflammation — a persistent systemic inflammatory state, clinically imperceptible in its initial phase, but progressively destructive in its metabolic effects.

Diets rich in simple sugars, trans fats, artificial additives and poor in fiber, polyphenols and essential fatty acids promote intestinal dysbiosis — microbiota imbalance — which results in increased intestinal permeability, translocation of bacterial lipopolysaccharides into the bloodstream and chronic activation of inflammatory pathways mediated by cytokines such as TNF-α, IL-6 and IL-1β (SONNENBURG; BÄCKHED, 2016). This is the molecular mechanism connecting today's inadequate school meal to tomorrow's type 2 diabetes.

Understanding this biological chain is not an exercise in academic erudition: it is what underpins the urgency of early nutritional intervention. The nutritionist working in collective health must be able to communicate this complexity accessibly — to managers, educators, families — without losing the scientific rigor that legitimizes their practice.

Ultra-Processed Foods: The Adversary We Must Name

The NOVA Classification, developed by the research group led by Professor Carlos Monteiro at the University of São Paulo, represents one of the most important contributions of Brazilian nutritional science to the world. By categorizing foods not only by their nutrient profile but by their degree of industrial processing, NOVA revealed what traditional nutritional labels concealed: that

ultra-processed foods — regardless of their caloric or macronutrient values — are independently associated with increased risk of obesity, cardiovascular disease, type 2 diabetes, depression and cancer (MONTEIRO et al., 2019).

For childhood nutrition, this has immediate practical and political implications. The presence of ultra-processed foods in school cafeterias, in lunch kits, in colorful packaging that reaches children's hands, represents a public health problem that cannot be resolved by nutritional education alone — it demands regulation, prohibition in school environments, reformulation of supplier contracts and political will.

The nutritionist cannot be neutral in this scenario. We must name the problem, quantify its effects and lead, based on evidence, the movement for healthier food environments in schools and communities.

The Multidisciplinary Approach: We Cannot Get There Alone

The Nutritionist, the Pediatrician and the Educator: A Necessary Alliance

No single profession is capable of resolving the complexity of children's nutritional health. Collective health is, by definition, a collective endeavor — and this requires the nutritionist to develop skills in teamwork, interprofessional communication and collaborative leadership.

The partnership with pediatrics is especially strategic. The pediatrician is frequently the first health professional to identify nutritional deviations in children — whether through monitoring growth curves during well-child visits, or through clinical perception of early signs of metabolic dysfunction. A well-constructed referral and counter-referral flow between pediatricians and nutritionists in health care networks can detect and intervene in nutritional risks years before they manifest as diseases.

The educator, in turn, is the professional who spends the most hours with the child outside the family environment. A teacher who understands the impact of nutrition on learning, concentration and behavior has more tools to identify at-risk children and to reinforce, in the school environment,

the principles of healthy eating. Training teachers in nutrition is not an easy task — but it is a very high-return investment.

The Family as the Center of Strategy: Engagement or Failure

Any school nutrition program that ignores the family is building on sand. Children spend, on average, only 5 hours per day at school. The other 19 hours are at home, shaped by family habits, food availability, dietary rituals and the models that surrounding adults provide.

Engaging families in food education programs is one of the greatest challenges — and one of the greatest opportunities — for the nutritionist in collective health. The approach must be empathetic, not prescriptive; inclusive, not elitist; practical, not theoretical. Low-cost healthy cooking workshops, WhatsApp groups with nutritional tips, conversation circles at parent meetings — these are simple strategies that, when well executed, produce transformative results.

Technology and Innovation in Service of Public Nutrition

We live in an era where technology can exponentially amplify the reach of nutritional interventions. Food diary applications, telemedicine platforms, integrated nutritional surveillance systems and artificial intelligence applied to the analysis of population dietary patterns are tools that the 21st-century nutritionist needs to know, master and use.

In the context of school health, digital systems for monitoring nutritional status — which allow the Technical Manager nutritionist to track in real time the evolution of the nutritional profile of the entire school community — represent a qualitative leap compared to monitoring based on physical files and annual assessments.

Technological innovation, however, does not replace human contact. The nutritionist who masters technology while maintaining clinical and social sensitivity is the professional that the future

of public health demands.

School Nutritional Consulting and Advisory: A Public Health Tool

The Continuous Advisory Model: Going Beyond One-Time Consulting

There is a fundamental difference between one-time consulting — a diagnosis, a prescription, a visit — and continuous advisory, which accompanies the process, monitors results, adjusts strategies and builds institutional capacity. In the school context, the latter is exponentially more effective.

A school that has a nutritionist in continuous advisory develops, over time, its own food culture. Teachers learn, kitchen staff become trained, children develop food autonomy, parents become engaged. The nutritionist stops being an external service provider and becomes part of the educational ecosystem.

This model has economic and epidemiological implications that must be valued. From a cost-effectiveness standpoint in public health, well-structured school nutritional interventions produce returns that far exceed their costs — through reduction of absenteeism, improvement in academic performance (yes, nutrition directly affects cognition and learning) and prevention of diseases that cost billions to the health system years later.

Quality Indicators in School Nutrition Programs

Every serious school nutrition program must be evaluated by objective indicators. Some of the most relevant include:

- Prevalence of overweight and obesity in the school community, monitored semi-annually;
- Adequacy of menus to PNAE guidelines or institutional nutritional policies;
- Percentage of ultra-processed foods offered in cafeterias and snack bars;

- Acceptance rate of healthy meals by students (a sensitive indicator of the quality of educational communication);
- Frequency and quality of food and nutritional education actions carried out;
- Level of nutritional knowledge among teachers — assessed before and after training programs;
- Family engagement in nutrition activities — measured by participation rate;
- Evolution of growth curves of the school population over time.

These indicators transform the nutritionist's work from a perception-based practice to an evidence-based practice — more defensible before managers, more replicable in other contexts and more capable of generating institutional learning.

Prevention of Chronic Diseases in Childhood: The Investment Brazil Needs to Make

Childhood Obesity: Far Beyond Aesthetics

Childhood obesity still carries, in many Brazilian cultural contexts, a connotation of health — 'chubby child is a healthy child' — that must be deconstructed with care, sensitivity and data. It is not an aesthetic problem nor a moral issue: childhood obesity is a chronic disease, with well-described pathophysiology, documented systemic consequences and deeply rooted social determinants.

From a metabolic standpoint, the child with obesity presents insulin resistance, atherogenic dyslipidemia, non-alcoholic fatty liver disease, polycystic ovary syndrome (in girls), sleep apnea and a cascade of inflammatory changes that accelerate cellular aging. More than that: the child with obesity has up to 80% probability of becoming an obese adult — and an obese adult has substantially elevated risk of heart attack, stroke, type 2 diabetes and certain types of cancer (OMS, 2016).

The human cost is immense. The economic cost as well. It is estimated that the treatment of diseases associated with obesity in Brazil consumes more than R$ 1.4 billion per year in hospital

admissions through the SUS. This figure does not include indirect costs — loss of productivity, absenteeism, outpatient costs, medications. Prevention is economically irresistible.

Type 2 Diabetes in Childhood: An Emergency That Has Arrived

Twenty years ago, type 2 diabetes in children and adolescents was considered so rare that it barely appeared in pediatrics discussions. Today it is an established clinical reality, with accelerated growth on all continents and growing prevalence in Brazil, especially in indigenous, Afro-descendant and low-income populations.

The prevention of type 2 diabetes in childhood passes entirely through nutrition. Reducing the intake of added sugars — especially industrial fructose in sugary beverages — increasing dietary fiber consumption, promoting a dietary pattern based on fresh foods and ensuring that children move regularly are the interventions with the greatest evidence of effectiveness in primary prevention of the disease (BRASIL, 2014).

The nutritionist who understands the pathophysiology of diabetes — insulin resistance, the role of the pancreas and liver, the dynamics of postprandial glycemia — is capable of translating this knowledge into accessible language, into practical guidance and into school feeding policies that truly make a difference.

Social Nutrition: The Context That Determines the Plate

The Social Determinants of Children's Nutrition

It would be a mistake — scientific and ethical — to discuss childhood nutrition without immersing ourselves in the social determinants that shape what a child eats. Nutrition is not a decontextualized individual choice: it is the result of a complex equation that involves family income, access to healthy foods, time available for meal preparation, food culture, advertising, peer pressure

and school environment.

A family living in a food desert — a peripheral neighborhood without access to a market or any point of sale of fresh food — cannot follow the recommendations of the Dietary Guidelines for the Brazilian Population, however beautiful they may be. A mother who works 10 hours a day and comes home at 8pm cannot cook every day. An adolescent living in an environment where soft drinks and chips are the only foods available during the school break is navigating against a current far stronger than nutritional education alone can neutralize.

Recognizing this is not excusing inaction — it is identifying the correct points of intervention. Social nutrition teaches us that transforming the food environment of a community is more powerful — and more just — than attempting to modify the individual behavior of people who have no conditions to make different choices.

Food and Nutritional Security as a Human Right

The human right to adequate food has been inscribed in the Brazilian Federal Constitution since 2010 (Constitutional Amendment No. 64) and in the Organic Law on Food and Nutritional Security (LOSAN) since 2006. This means that ensuring that all Brazilian children have access to safe, nutritious and culturally adequate food is not a state benevolence — it is a constitutional obligation.

The nutritionist working in collective health is, in this sense, a human rights agent. Their work in vulnerable territories, in public schools in peripheries, in primary health care units in municipalities with high prevalence of food insecurity, is not only technically necessary — it is politically fundamental. It is the practical expression of a belief that every child, regardless of where they were born, deserves a dignified plate.

Training the Nutritionist of the Future: Competencies for a Changing World

The Profile of the Nutritionist in Public Health

The training of Brazilian nutritionists urgently needs to incorporate competencies that go beyond nutrient biochemistry and meal plan development. The professional that Brazil needs — especially in the coming decades, given the epidemiological scenario that is unfolding — must be:

- Scientifically rigorous: capable of reading and interpreting evidence, distinguishing correlation from causality and grounding their recommendations in solid data;
- Politically engaged: understanding that nutrition is a field of competing interests — from the food industry, public managers and communities — and that taking sides with evidence and vulnerable populations is an ethical imperative;
- An effective communicator: capable of translating scientific complexity into accessible language for distinct audiences — children, families, managers, journalists, legislators;
- A competent manager: with skills in planning, execution, monitoring and evaluation of nutritional programs at a population scale;
- A deep knower of the social determinants of health: understanding that nutrition does not occur in a vacuum and that solutions must be contextually sensitive;
- Collaborative and multidisciplinary: capable of working in interprofessional teams, sharing leadership and building strategic partnerships.

This training does not begin at university — it begins with the choice to be a professional who believes in the power of nutrition to transform lives. And it does not end at graduation — it is a journey of continuous learning, intellectual humility and renewed commitment to science and to people.

Final Considerations: The Future of Health Is Built Today

We arrive at the end of this chapter with a certainty that I hope to have conveyed with the force it deserves: childhood nutrition is one of the most intelligent investments a nation can make in its own future. Every real invested in the adequate nutrition of a child generates returns that multiply — in health, in cognition, in productivity, in happiness, in citizenship.

The nutritionist who works with children — whether in individual clinical practice, in public policies, in school consulting, or in research — is not merely prescribing nutrients. They are shaping metabolisms, forming microbiomes, strengthening immune systems, preventing diseases, liberating lives from the weight of chronicity.

But to fulfill this role with the grandeur it demands, we must recognize ourselves as what we are: agents of social transformation. Professionals with a responsibility that transcends the consultation and the diet. Silent architects of healthier futures.

"The best time to plant a tree was twenty years ago. The second-best time is now. The same logic applies to the nutritional health of our children. Every day of inaction is a day of lost opportunity. And children cannot wait." — Author's Reflection

May this chapter inspire not only reflection, but action. May every professional who reads it emerge with greater clarity about their role, more determination to exercise it and more courage to defend, at any table they sit at, the right of every child to a nutrition that allows them to grow — not only in stature, but in health, in potential and in dignity.

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