

Food, rights, and politics: the post-war years (1945–60)

O U T L I N E

3.1 A new gold standard	80	3.8 The link between malnutrition and infection	88
3.2 The United Nations human rights commission of 1948	80	3.9 Genetic engineering further milestones	88
3.3 The Marshall plan	81	3.10 Surpluses and the agricultural trade development and assistance act	89
3.4 General agreement on tariffs and trade	82	3.11 The European economic community	93
3.5 Post-war nutritional reconstruction	82	3.12 The great leap forward famine (1958–61)	93
3.5.1 <i>Food and agriculture organization</i>	83	3.13 Declaration of the rights of the child (1959)	94
3.5.2 <i>The world health organization</i>	83	3.14 The freedom from hunger campaign	94
3.5.3 <i>The UN international children's emergency fund</i>	84	3.15 World food program	96
3.5.4 <i>FAO first world food survey (1946)</i>	84	3.15.1 <i>The returning burden of surplus</i>	96
3.5.5 <i>International nutritional requirements (1949)</i>	85	3.16 Hope holds out	97
3.5.6 <i>Kwashiorkor and protein energy malnutrition</i>	85	3.17 The green revolution	97
3.5.7 <i>Protein energy requirements</i>	86		
3.6 FAO second world food survey 1952	86		
3.7 Gender and work rates	87		

3.18 Single-cell proteins	97	3.20 The third world food survey	99
3.19 Protein and the growing kwashiorkor–marasmus debate	98	References	99

3.1 A new gold standard

Ravaged by the Second World War, the world's financial markets were in chaos. Consequently, regulation and stability had to be brought back; as a result the job was given over to the United Nations and the as-yet untested World Bank Group (the IMF and the IBRD). Luckily, one of the outcomes of the Bretton Woods agreement was to establish an alternative to the previous difficulties of maintaining a stable gold standard. The difficulty with the original gold standard system of 1875–1914 was that countries had to maintain voluminous gold reserves in case of common currency volatility. This was found to be very fragile and restrictive at best and it was not long before countries were dropping out of the system. A new system had to be found, and harking back to the Bretton Woods talks was the agreement of a fixed monetary exchange system. Similar to the previous mentioned gold standard whereby a country's monetary system was fixed at a specific rate to that of gold, the new system would fix or peg other countries' currencies to that of the US dollar. This new par value 1 system, as it was called, then pegged the US dollar to gold at a rate of \$35 per ounce, the inference now being that US dollar would become the new gold standard, and large hordes of gold were no longer needed at the country level. Initial response to this system was positive and helped nervous global economy to settle down and stabilize. This brought back some measure of stability to the exchange rate system and facilitated the return of stable international trade without the fear of wild swings in the terms of trade.

Separately, on the “right to food” front, the fledgling United Nations set up the Human Rights Commission [ITO \(1948\)](#) chaired by Roosevelt's widow Eleanor. This was a pivotal moment in the history of food as a right.

3.2 The United Nations human rights commission of 1948

Considering the disparate cultural values, ideologies, and political systems, as well as the religious beliefs of the then 58 member states, the fact that any cross-cultural Declaration was agreed upon was a minor miracle in itself. Representing a remarkable achievement of cooperation spanning 18 months, the resultant document during a period where war weary nations sought direction and focus on both physical and social matters. Through the incorporation of a common set of values as described above, the Universal Declaration of Human Rights (UDHR) represented a unified vision of an equitable world sharing more than just a simple set of common ideologies; it was a forward-looking philosophical instrument beyond its years.

The declaration was finally drafted on December 10 of that year (UN, 1948), comprising 30 articles spanning the right to freedom (Article 1) to the right to education (Article 26). The declaration can be simply divided into two main parts whereby articles 3 to 21 dealt almost exclusively with civil and political rights from torture, arbitrary arrest together with slavery and the freedom of movement. The second part, articles 22 to 27, dealt once again almost exclusively with the social, economic, and cultural rights viz-a-viz work community and leisure and education. However, in this mix was also an important milestone in what was called the food security; in article 25 specifically parts one and two, every man woman and child's right to food was recognized. Once again this was a remarkable achievement considering the makeup both politically and philosophically of the member group (Gibson, 2016). Article 25 went on to describe

- (1) That everyone had a right to a standard of living that would maintain the health and well-being of oneself and their families, comprising housing, medical care, social services including unemployment, sickness, old age, and of course the right to sufficient and adequate food.
- (2) Moreover, it was determined both mothers and children were entitled to extra special attention, especially if the child was born out of wedlock, in which case both should enjoy the same governing principles, in terms of social and welfare protection (UN, 1948).

Building on experience of the First World War, food was once again a hot topic.

3.3 The Marshall plan

Indeed, at the outset of the Second World War, Allied governments colluded and introduced preferential bilateral and multilateral trade agreements promoting domestic production over the importation of foodstuffs. This made perfect sense because of the experience of the First World War whereby the German U-boat campaign was relatively successful in blockading some of the Allied countries, thus making it difficult to receive food imports. Yet, whichever way you looked at it, this did not sit well with certain nations who despite the war relied on international trade to support economic growth. Compounding the problem with the allied forces continuing price support policies which not surprisingly ended up with large food surpluses. In fact, it was foreseen that the surpluses would continue after the war with one contemporary observer noting:

the [FAO] ... will soon be faced with the problem of disposing of supplies which cannot be marketed at profitable prices ... [if] the goal of freedom from want is to be brought within even approximate reach, the problem of expanding world purchasing power must be solved A progressive expansion of world purchasing power, associated with national policies which facilitate rather than impede necessary transfers of resources, provides the setting in which surpluses will be least depressing on price and most easy to handle ...
Belshaw (1947), (insertions by Gibson (2016)).

This was not so for everybody as some countries were still food impoverished finding it difficult to import necessary supplies in the face of insufficient foreign reserves.

However, not everything fell on the wrong side of the balance sheet. In line with the avowed global cooperation philosophy and aid, the 1947–1948 US Foreign Assistance Act permitted post-war European economic recovery to begin. In turn, this act opened the doors for Truman’s Secretary of State George C. Marshall’s European Recovery Program (ERP) or more commonly the “Marshall Plan” (Borchard, 1947). The stated goal was not unlike the previous United Nations Relief and Rehabilitation Administration (UNRRA) goals of earlier times in which international relief was administered to those that required it. While the previous efforts of the UNRRA acted as a blueprint for the Marshall plan, the Marshall plan was not without political agenda (Williams, 2005).

So, what was the Marshall plan? Overall, it involved multibillion-dollar program of financial, technical, and food aid over a 4-year period to facilitate the redevelopment of Europe. Yet despite its flaws it came to an end in 1951 and was hailed as one of the most remarkable achievements of humanitarian aid ever to have taken place. It was an eye-opener too; in that it was the first full realization of the social and economic interdependence of nations. Globalization had truly begun (Borchard, 1947; Crawford, 1949; Scott, 1951; Weir, 1952; Hoffmann and Maier, 1984; FAS, 2018; USAID, 2009b; USAID, 2009c).

Meanwhile, at around this time, the idea of more equitable terms of trade for everybody stepped out of this theoretical phase and entered the spotlight.

3.4 General agreement on tariffs and trade

As a result of the large number of international barriers that flew in the face of the underlying previously agreed principles of global free trade and equitable cooperation, something had to be done. Amid loud calls for change the United Nations Economic and Social Council (ECOSOC) tasked The New International Trade Organization (ITO) with the coordination of more equitable multilateral trade policies. That was in 1946, and by 1947 an international treaty called the General Agreement on Tariffs and Trade (GATT) was initiated and ready to operate under the ITO. However, the ITO never got off the ground, yet the GATT continued and ending up being an important instrument that would prove its worth many times over the ensuing years (Gibson, 2016).

Post-war reconstruction was not just about infrastructure or economic development, it was also about food and nutritional construction.

3.5 Post-war nutritional reconstruction

As a direct result of the outbreak of World War II, great deal of work by both the League of Nations’ (HOLN) health units and the Office International d’Hygiène Publique (OIHP) was put on hold. Yet very real fears of the potential for widespread epidemic rallied the UN’s UNRRA placing health among its primary responsibilities.

Immediately preceding the war, the task development and reconstruction provided the first real challenge of international cooperation. Leading the multilateral effort was the United States Marshall plan and the newly created United Nations. Initially, the British dominated

Allied Committee on Post-War Reconstruction Requirements (the Leith Ross Committee) began planning the relief requirements required of each nation; however, it was a slow process and lacked direction. As a result, it was superseded by the Office of Foreign Relief and Rehabilitation Operations (OFRRO) set up by Roosevelt in 1942 and headed by Herbert Lehman was a little more proactive in the mission. Together with the UN Relief and Rehabilitation Administration (UNRRA) (also headed by Lehman) worked tirelessly providing much needed relief supplies. And recognizing the role of mothers and children in the rehabilitation process milk and other relief supplies became the preferred choice in existing infant school feeding programs. However, when it came to the refugees, who also fell under the umbrella of the UNRRA, it was just one job too many and was eventually delegated to the International Refugee Organization (IRO) (House of Commons, 1946; USHMM, 2010) (Broughton, 1997).

About this time too, there was much debate over the future of certain international health policies among loosely related bodies, in particular the FAO; WHO; and UNICEF. Increasing infighting took place among the rival organizations; the first on the scene was the FAO.

3.5.1 Food and agriculture organization

Although the League of Nations held its final meeting in April 1946, the organization was all but essentially laid to rest with the United Nations more or less taking over where the league left off (Sweetser, 1946; Goodrich, 1947). Proposed in 1943 and officially created in 1945, one of the first bodies of the new United Nations was the Food and Agricultural Organization (FAO). Its new Director General was none other than the nutritional scientist Sir John Boyd Orr ², whose first task was to appoint Dr. W. R. Aykroyd as Director of the FAO's Nutrition Division. Early on while its remit was specifically to improve the lot of global agriculture, forestry, and fisheries, Boyd Orr, Aykroyd, and others saw their role as taking in a more broader aspect to include general welfare: "... to end hunger and raise general standards of nutrition." (Gillespie, 2003). The next on the scene was the WHO.

3.5.2 The world health organization

In the first meeting of the ECOSOC Economic and Social Council (1947), the creation of a permanent specialized health organization was considered, after which much wrangling went on to establish the World Health Organization. Its mission was to carry on the previous functions of the League of Nations as well as the OIHP (EoN, 2009). In the meantime, the Interim Commission of the proposed WHO continued the work of health functions of the UNRRA's until the WHO's constitution was finally ratified ITO, 1948. This was a departure from what was expected of the WHO as in its initial inception there was little room for the WHO to be involved in such cases or programs such as child and maternal health care. This was counter to what some people expected, or as seen by some an effort to expand the remit of the WHO beyond a mere institution concerned with hygiene and little else. However, fierce opposition to a dumbed-down body prevailed and the final draft of the WHO ensured it became a much-needed universal public health organization (WHO, 1946).

Then came UNICEF.

3.5.3 The UN international children's emergency fund

Before the final meeting of UNRRA in 1946, the United States Army's film makers made a short 19-minute documentary called the "Seeds of Destiny." Shockingly the film was full of harrowing images of children in hospitals and orphanages and others foraging and begging for food. By highlighting the plight of postwar children, the short film was aired at the last meeting of UNRRA's governing council. However, the stark reality of the production was both moving and disturbing. Consequently, the Council proposed to the United Nations that its considerable surplus funds be used to continue and enhance the relief effort for needy children (UNICEF, 2005). As a direct result of the meeting, a new child-welfare organization—the UN International Children's Emergency Fund (UNICEF)—was established to provide much-needed relief assistance to children of post-war Europe. Maurice Pate, the enthusiastic and pragmatic head of the new body, only accepted the post on provision that UNICEF would mandatorily include all needy children, no matter creed or color and, more importantly, the political persuasion of the children's parent government. It was a controversial decision that sought to place children outside of institutional politics, especially among a growing number of committees and reports, etc. (UNICEF, 2005)

It was also eloquently pointed out in a lecture given in honor of UNICEF receiving the 1965 Nobel Peace Prize by the then chairman Zena Harman who suggested

Child suffering could not be distinguished by virtue of its cause or origin. Children in desperate need anywhere and everywhere required help and attention. (Nobel Prize, 2010).

At the outset, UNICEF was only supposed to be a temporary affair with an original mandate that recognized children's health to be of primary importance. The basic needs of such children were considered to include adequate nutritional food; protection against disease; shelter and clothing; clean and safe water; and a suitable environment in which children can grow both emotionally and socially. It was already understood that schools were an exceptional means by which distribution and monitoring programs aimed at health care and nutritionally deficient children could fairly easily be achieved. As a result, by the end of WW2, UNICEF was primarily dedicated to supplementary feeding programs of school-age children.

3.5.4 FAO first world food survey (1946)

The first world food survey of the FAO in 1946 involved 70 countries which included many nutritionally savvy governments and people's from across the globe. During the conference, there was widespread agreement regarding the existence of the problem of global hunger and malnutrition, yet what was lacking was the fact there was very little evidence to back this up. This was summarized by the FAO at the time when commenting on the issue:

... it is well known that there is much starvation and malnutrition in the world [yet] vague knowledge that this situation exists is not enough; facts and figures are needed if the nations are to attempt to do away with famine and malnutrition (FAO, 1995).

However, due in large part to the cessation or the breakdown of statistical data gathering during the war, final estimates relied heavily on estimations and imprecise data. Nevertheless, by providing a pre-war baseline of total and per-capita calorie availability, this marked the beginning of ongoing longitudinal research for the FAO. In this sense, the report provided solid semiscientific evidence indorsing long-held beliefs that global hunger and malnourishment did indeed exist, and at staggering levels too. The report indicated that more than half of the global population survives on less than 2250 calories per day (FAO, 1995).

Having established, not only the existence of hunger and malnourishment but also the report identified the extent to which it prevailed; there were now no excuses for doing nothing. The next step then was to establish long-range nutritional targets to 1960 based on apparent needs while also taking into account a population increase in the range of 25% (FAO, 1946; McMillan, 1946; Belshaw, 1947).

By 1948, the FAO had fully recognized the importance of food, energy, and nutrition as central to its remit within the United Nations (Weisell, 1995).

3.5.5 International nutritional requirements (1949)

In order that nutritional requirements are met, it is incumbent on the provider to fully understand the needs and requirements of humanity (FAO, 2002). Thus, continuing where the League of Nations left off, the UN's Food and Agricultural Organization's Food and Nutrition Division convened an expert committee (Committee on Calorie Requirements) took up the challenge in 1949; the remap was to undertake the first of several nutritional-related human energy and nutrient requirement reviews (Aykroyd, 1956; Périssé, 1981; FAO, 2003). The outcome was based on the 1947 report of the FAO's Food Composition Tables, in particular, the Calorie Conversion Factors in which the Committee on Calorie Requirements authored the first real international food composition tables (Chatfield, 1949; FAO, 1950; Aykroyd, 1956). These tables and the following 1949 revisions (published in 1950) were designed using the early pioneering work of Atwater's food energy conversion factors around the turn of the century (Wu Leung, Busson et al., 1968). The first incarnation of the tables expressed food values in calorie, protein, fat, and carbohydrate content (Chatfield, 1949); however, the tables were subsequently revised and extended to incorporate vitamins and minerals, firstly in 1954 and then in 1955 by Merrill and Watt (Chatfield, 1954; WHO, 1955; Aykroyd, 1956; Wu Leung, Busson et al., 1968; Weisell, 1995). By this time, a country's food balance sheets noticeably took on more importance. Their ability in analyzing a country's food situation was indeed well understood, so much so in fact that the FAO ITO, 1948 recommended that nations develop their own food balance sheets have published regularly. The FAO's "Handbook for the Preparation of Food Balance Sheets" first published in 1949 is still published periodically to this day (FAO, 2001).

3.5.6 Kwashiorkor and protein energy malnutrition

During the 1950s, children's nutritional welfare was still very much high on the agenda (WHO, 1950; WHO, 1951; WHO, 1953; WHO, 1955). The First Joint FAO/WHO Expert Committee on Nutrition observed that high mortality rates of infants and children, particularly in the tropical and subtropical regions, were blamed on widespread disorders, the most

prevalent of which was kwashiorkor (a condition that was thought resulted from a lack of protein intake) (WHO, 1950; WHO, 1953). It was also noted that once the infant came off weaning and went on to solids comprising cereals and other foods containing very little milk, ergo more protein (PEM) was seen to take place (WHO, 1950, pg 16). Furthermore, the FAO/WHO's report was further enhanced by Brock and Autret's report further detailed the extent of kwashiorkor in Africa at the time (Brock and Autret, 1952). As we know now, the observations were slightly off key. However, contemporary 1950s collective conscience was still under the assumption that PEM was a major contributor to malnutrition and many new policies and humanitarian aid was based on this assumption. Back to the 1950s and in answer to the perceived ongoing problem, the joint Committee advocated more education for professionals and lay people alike. During the same time, Joint FAO/WHO Expert Committee on Nutrition launched a worldwide investigation to research and assess the extent of the malady (WHO, 1951; WHO, 1958; Weisell, 1995). Complementing these proactive measures, increased research into nutritional requirements was undertaken in support of the FAO's 1949 energy and calorie requirement tables (WHO, 1951). This indirectly led to the second world food survey (see below).

In terms of terminology, although "kwashiorkor" was first coined by Cecilly Williams during the early 1930s, it had not by the late 1950s been adopted as a catchall for protein energy malnutrition. However, in 1952, the expert committee met in Gambia and used the term kwashiorkor to better distinguish this type of protein energy malnutrition to other types of protein malnutrition—from this point forward, kwashiorkor became synonymous with protein malnutrition.

3.5.7 Protein energy requirements

While a considerable body of work was collected, collated, and analyzed, it was the research in respect of specific energy producing nutrients for the individual that took on greater importance (FAO, 2002). Consequently, during the early 1950s, scientists were becoming increasingly aware that aiming for optimal energy giving nutrients (in particular an obsession with protein) alone was done so at the expense of other nutrient and trace element research. In other words, sufficient energy alone did not necessarily provide adequate nutrition (Allen, 2003; Gibson, 2016). This obsession with protein as the main nutrient was further studied. This included Nevin Scrimshaw and others in their research on infants and breastmilk among other things, which in the end revealed that protein was not the single or sole source of food. It was first realized through the work of Nevin Scrimshaw and others that protein deficiency in infants first developed when breast milk was no longer the single or sole source of food. Thus, cheap alternatives to milk protein were sought in an effort to slow down and prevent kwashiorkor as it was known in weaning infants.

3.6 FAO second world food survey 1952

The second World Food Survey revealed global estimates of calorie and protein supply and concluded that the situation was even worse than the first survey (1946). The survey

averaged per capita calorie availability (after adjusting for losses, seed, and feed), for total world output grounded on a daily supply of 2600 calories/capita. This stark reality serves to express the fact that with these figures, over two-thirds of the global population was actually undernourished.

Such results led to the credence that kwashiorkor was indeed one of the most serious and nutritional disorder in the world at the time (Goldsmith, 1955; Aykroyd, 1956).

Buoyed by the report, the FAO and WHO alongside the Josiah Macy Jr. Foundation held a conference in June 1955 to discuss such matters. Following this the WHO established the Protein Advisory Group (PAG), drawn from some of the most revered experts of the time (WHO, 1958). The PAG's official role was adviser to the FAO, the WHO, and UNICEF. The group ultimately recommended that protein be the foundation of most nutritional programs from that point on. Supported by top nutritionists from developing countries the PAG became very influential, although the PAG was eventually rolled into a tripartite program in 1961 (FAO/UNICEF/WHO) (Aykroyd, 1956; PAG, 1967; WHO, 1972; Carpenter, 1994; Weisell, 1995).

Around the middle of the 1950s, further bodies and committees came together to recommend a suite of protein requirements for the token adult or child (FAO, 1955). This is despite the fact that such research had already been undertaken several times before by others including the League of Nations. For adults, the FAO's protein findings were calculated to be 0.35 g/kg of body weight, which is a great difference compared to values given by the League of Nations at 1 g/kg in its 1936 report. While for children and adolescents, despite limited data meant that results were largely estimated at 0.7–0.8 g/kg. Although tentative, the report did encourage further research, which was taken up by the 1963 FAO/WHO Expert Group (FAO/WHO, 1973; WHO, 1973; Allen, 2000).

3.7 Gender and work rates

By 1956, the second FAO Calorie Committee reconfirmed the practicality of the notion of a certain number of calories per day for a “reference” male and female. Although to this there was some minor revisions made to the overall daily calorie allowances:

... a range of energy expenditure between 2400 and 4000 kcal/day for men and between 1600 and 3000 for women would appear to include most human beings (FAO (1957), pg 16.

The second Committee also reacknowledged the difficulty in allowances due to the difference in physical activity levels by which the reference male or female person is modified. For such purposes, the committee referred to the Christensen classification of work (Table 3.1). That said, Passmore (1964) in his review was troubled by the fact that there were a multitude of alternative classifications in use at the time and strongly suggested that it would be more scientifically prudent if a single agreed scale were used for the various work rates (Passmore, 1964).

There was also one more important difference in FAO's calculations of energy requirements. This was contrary to the work of Voit, Atwater, Lusk, NRC, and others who traditionally based advisory energy requirements on food intake alone. By contrast, the new FAO 1957

TABLE 3.1 Christensen's energy expenditure rates at differing work levels.

Work rate	kcal/min
Very light	Less than 2.5
Light	2.5–4.9
Moderate	5.0–7.4
Heavy	7.5–9.9
Very heavy	More than 10.0

Source: Christensen's *Physiological Valuation of Work in the Nykroppa Iron Works*. *Ergonomics Society Symposium on Fatigue*. Ed's W. F. Floyd and A. T. Welford (London, Lewis. 93–108, 1953).

report encouraged the use of energy expenditure to calculate energy requirements (FAO, 1957; Henry, 2005).

3.8 The link between malnutrition and infection

People had long since postured a connection between health and infection. By the mid- to late 1950s, two successive Joint FAO/WHO Expert Committee's on Nutrition showed concern for the lack of knowledge regarding any interaction between nutrition and infection. It was finally through the work of Scrimshaw, Taylor, and Gordon that light shed on this potential link. However, it was not until 1959, in a paper written for the *American Journal of the Medical Sciences*, that Scrimshaw and colleagues noted a scientific correlation between both malnutrition and diarrhea. Through extensive research, the authors firmly suggested that susceptibility to infection was one outcome of poor malnutrition. Furthermore, it was seen that any infection contributed to a synergistic relationship, which in turn caused further deterioration of the person's nutritional status. Such interactions too it seemed were further exacerbated when malnutrition and infection were present simultaneously. Combined this seemed to amplify the individual effects of either one alone. As a result, the study's message seemed to suggest that to break the vicious cycle, it was not merely enough to intervene to break the cycle, but rather it was preferable to tackle both nutrition and infection at the same time if an optimal outcome was to be achieved (Scrimshaw et al., 1959; Keusch, 2003).

3.9 Genetic engineering further milestones

This was also a period in which genetic engineering really stood out. By 1946, in the discipline of genetics, both Edward Tatum and Joshua Lederberg observed that bacteria could occasionally exchange genetic material. This was quite a leap, yet in the same year, independently, Max Delbruck and Alfred Day Hershey revealed that during the process of genetic recombination, genetic material from different viruses could indeed be united forming a new type of virus. Adjacently, progress in the field of biology witnessed the isolation and growth of animal cells in vitro. 1950 was also the time that the first instance of artificial

insemination within livestock using frozen semen was used; this was tremendous news especially for the farmers. Furthermore, among scientists, the boundaries of electron microscopy were being pushed further and further and by 1952, microscopes were now able to see the tiny well-formed anatomical structures or organelles that existed inside eukaryotic cells.

A little time earlier the transfer of genetic material from parent to child was still only a matter of guesswork. It took Oswald T Avery's work with bacteria in which he postulated that it was the nucleic acid, the DNA of the cells and not proteins (as was often suggested) that actually contained the genetic material of life. This theory paved the way for Watson and Crick's later discovery. In fact, on the subject of Watson and Crick, without doubt, in terms of biological advancement, the discovery in 1953, of the molecular structure of DNA by James Watson and Francis (Watson and Crick, 1953). In their observation's DNA molecules comprised a double-stranded, helical model. To simply state that this was of great importance is an understatement in itself; however, such a major breakthrough in genetics was remarkable as, to this point the method of transfer of genetic from parents to offspring till this point had only been conjecture. What Francis and Crick showed, was a biological vehicle that allowed for the transfer of genetic material from adult to offspring. This effectively opens the door to the potential of DNA, which proved to be extremely complex, and indeed it was able to carry the complete coded recipe for heredity. This further strengthened the belief in the "DNA-gene" transfer theory and ultimately the principles of Mendelian inheritance.

Such a discovery opened up untold possibilities of introducing into the gene pool cures for human diseases and other significant uses. What perhaps Watson and Crick did not foresee was the ramifications such a breakthrough was to have on the way we looked the food we consume. In one respect it opens up a whole: "Aladdin's cave of possibilities whilst on the other it threatens a Pandora's box of ills" (Gibson, 2016). Key moments of this era can be seen in the following Table 3.2:

3.10 Surpluses and the agricultural trade development and assistance act

In the United States, as the Marshall Plan slowed in 1949/50, stocks of grain once again began to rise. This led to ongoing storage problems including costs and also in some instances to depressed producer prices. Overproduction of food in the absence of previously strong European aid exports was again turning into a serious problem for the United States. Domestically, the United States increased government interventionist policies in an attempt to slow down the overheating of the agricultural market. By this time too, Eisenhower managed to push through the Agricultural Trade Development and Assistance Act in 1954. The act also called the Public Law 480 (PL 480) and contained four titles (Table 3.3), which paved the way for direct donation of US agricultural commodities to be used in emergency and nonemergency programs alike. However, it was met with mixed blessings; on the one hand it was seen as an altruistic gesture on the part of the Americans to be used as aid in developing countries as part of their developmental agenda (Sullivan, 1970). On the other hand, others saw this altruism as politically charged and has often been cited agricultural surpluses were being transformed into a US foreign policy program (Toma, 1967; Sullivan, 1970; USAID, 2009a).

TABLE 3.2 Key dates of the period: 1946 to 49.

Date	Key dates of the period
1946 Administrative Committee on Coordination (ACC)	The Administrative Committee on Coordination (ACC) was established in 1946. Its main functions were to help achieve the coordination of UN programs and to aid in the implementation of agreements between the United Nations and the specialized agencies. A number of subcommittees also evolved with a similar focus on coordination and cooperation of work programs throughout the UN system. In the end, the ACC became the CEB in 2001 (Mezzalama et al. 1999; CEB 2010; IANWGE 2010).
1946 Nutrition Division of FAO	Predicated predominantly on increasing food supplies, the FAO was launched in 1946. Its other remit was to raise levels of nutrition throughout the world. The FAO was aided by the Standing Advisory Committee on Nutrition, which met three times: 1946, 1947, and 1948, which was itself replaced by the Joint FAO/WHO Expert Committee on Nutrition who continued to advise the FAO until the joint committees' end in 1954 (WHO 1950; Aykroyd 1956).
1946 International Trade Organization (ITO)	The UN Economic and Social Committee (1946) began talks on a conference to draft a charter for an International Trade Organization (ITO), which would become a specialized agency of the UN. Completed in 1948, the Charter set out the fundamental rules for international trade. The ITO Charter, however, was not approved; instead, GATT took its place (ITO 1948; WTO 2010).
1946 International Emergency Food Council (IEFC)	After WW2, the International Emergency Food Council (IEFC) was organized by FAO to mitigate problems regarding the ensuing world food crisis. It ran until 1948 at which point the FAO absorbed and renamed it the International Emergency Food Committee (IEFC) (FAO 1947; NAL 2010).
1946 The UN International Children's Emergency Fund (UNICEF)	UNICEF provided emergency relief assistance to the children of post-war Europe and China but then changed focus to concentrate on long-term benefits to children everywhere, especially those in developing countries. Consequently, the name was changed to the UN Children's Fund, but the acronym "UNICEF" was kept (UNICEF 2005).
1946 The Division for the Advancement of Women (DAW)	The Division for the Advancement of Women was established as a Section on the Status of Women in the Human Rights Division of the Department of Social Affairs (DAW 2009).
1947 UK's Agriculture Act	The AA's support for using mostly deficiency payments guaranteeing a certain market price for food became challenging as consumers continued to pay market prices, while farmers were protected irrespective of market forces. This was supposed to be a policy predicated on stability and efficiency (Bikistow 1998; OPSI 2007).
1947 General Agreement on Tariffs and Trade (GATT)	The GATT was supposed to have been a provisional agreement intended as a stop gap while the ITO was being drafted. Yet, with the collapse of the ITO, provisional agreements for GATT to operate in its place lasted from 1947–94 after which the WTO took up the mantel. The GATTs role was to substantially reduce tariffs between member nations and thus facilitate better world trade. There were eight rounds of trade talks spanning more than 30 years (WTO 2010).
1947 The Economic Commission for Europe (ECE)	One of the five regional commissions of ECE headquartered in Geneva was to establish help and mobilize action for the economic reconstruction of post-war Europe

TABLE 3.2 Key dates of the period: 1946 to 49.—cont'd

Date	Key dates of the period
	and to increase European economic activity both within and outside the region (UNECE 2010).
1947 Economic and Social Commission for Asia and the Pacific (ESCAP)	Established in 1947 UN ECOSOC, headquartered in Bangkok, with a Pacific Operations Centre based in Port Vila, Vanuatu. ECOSOC essentially operated in regions that contained more than half the world's population (ESCAP 2010).
1946 UN Population Commission	The Population Commission was established by ECOSOC as a subsidiary body to research and advise the General Council on the size, demographics, and other changes in the world population (POPIN 1994).
1946 Meals for Millions	One man Clifford E. Clinton had the vision to end world hunger; he formed Meals for Millions in 1946, which joined forces in 1960 with Kennedy's Freedom from Hunger Foundation (Freedom from Hunger 2010).
1947 Interim Coordinating Committee for International Commodity Arrangements (ICCICA)	ECOSOC recommended the establishment of Interim Coordinating Committee for International Commodity Arrangements (ICCICA) to help with trade and tariff reductions (GATT 1952; Khan 1982).
1947/48 US Foreign Assistance Act aka Marshall Plan	The Marshall's European Recovery Program (ERR) involved a 4-year, multi-billion-dollar program of financial, technical, and food aid for the redevelopment of Europe.
1947 GATT 1st Round Geneva	In 1948, the agreement signed by 23 countries allowed the GATT and members to promote over 45,000 tariff reductions affecting over \$10 billion worth of trade, amounting to 20% of the total global market at the time (Morrison 1986; WTO 2010).
1948 FAO Standing Advisory Committee	The Standing Advisory Committee advised that "...the problem of assessing the calorie and nutrient requirements of human beings, with the greatest possible degree of accuracy, is of basic importance to FAO" (Weisell 2002).
1948 The World Health Organization (WHO)	During this period having taken over from the LoN's Health Organization, The WHO, a specialized agency of the UN, was tasked with coordinating and disseminating info on international public health issues (WHO 1998; WHO 2010).
1948 Universal Declaration of Human Rights	The Declaration, adopted by the UN General Assembly, arose out of the ashes of the experiences of WW2 representing the first global appearance of a 'rights' based approach (UN 1948).
1949 Committee on Commodity Problems (CCP)	The FAO set up the Committee on Commodity Problems (CCP) as a committee of the FAO council its responsibilities were to continually review any international commodity problems that might affect production, trade, distribution, consumption and related economic matters and relate this info back to the FAO (CCP 2005a,b).
1949 International Wheat Council (IWC)	The 1949 International seat of the Wheat Council (IWC) was finally established in London (IGC 2009).
1949 GATT 2nd Round Annecy	In the second GATT rounds were around 5000 tariff reductions (Morrison 1986; WTO 2010).

Compiled from multiple sources: FAO (1947); ITO (1948); WHO (1950); Aykroyd (1956); Mezzalama et al. (1999); UNICEF (2005); CEB (2010); ESCAP (2010); LANWGE (2010); NAL (2010); WTO (2010); ITO (1948); UN (1948); WHO (1950); GATT (1952); Aykroyd (1956); Khan (1982); Morrison (1986); POPIN (1994); Bikistow (1998); Weisell (2002); OPSI (2007); DAW (2009); IGC (2009); ESCAP (2010); Freedom from Hunger (2010); UNECE (2010); WTO (2010).

TABLE 3.3 Agricultural trade development assistance Act: PL 480.

Title	Title objectives	Administered by:
Title 1	Trade and Development Assistance: Providing for government-to-government sales of US agricultural commodities specially to developing countries on favorable credit or grant terms	USDA
Title 2	Emergency and Development Assistance Program	USAID
Title 3	Food for Development	USAID
Title 5	Farmer to Farmer	USAID

Source: Compiled from multiple sources [Toma \(1967\)](#); [Eulau \(1968\)](#); [Sullivan 1970](#); [USDA \(2009\)](#).

While the PL480 was underway, there were parallel debates over government interventionism in general and the regulation of prices, productivity, and fair trade as a matter of principle ([Dimitri et al., 2005](#)). Moreover, the United Nations Committee on Commodity Problems (CCP) failed in its 1946/7 efforts to achieve an International Commodity Clearing House (ICCH) in an attempt to address a proposed World Food Reserve. This was because a report concluded that technical and financial difficulties, rather than physical world food shortages, were larger impediments in the relief of emergency famine or other humanitarian aids. However, while some argue this is true, others see the failure of the clearing house as being attributed to the reluctance of United states and United Kingdom to devolve such power to a multilateral organization over which both the United States and United Kingdom had no control over ([UN, 1945](#); [FAO, 1957](#); [FAO, 1958](#); [GATT, 1960](#)).

That said, the passing of the Agricultural Act in 1956 (also known as the soil bank program) allowed the Sec of Agriculture to offer surplus farm products to humanitarian/voluntary agencies that were registered with the Department of State's Advisory Committee on Voluntary Foreign Aid. On the face of it, this was a positive move in the right direction as surplus US grain stocks were distributed around the world. However, while this was in line with America's foreign policy aim, others argued that it better served America's domestic policy by opening up new global markets. In reality, it was probably a little of both especially at a time when choice was a scarce commodity ([Sullivan, 1970](#); [Webb et al., 2008](#)). Yet, as with many good things, this was set to change, with the expansion of humanitarian aid from not only governments but also through NGOs like CARE international and Catholic Relief Services to name a few, so people began to ask questions. The lines were being blurred as some argued that domestic agricultural policies were being favored over foreign policy objectives. In fact, that aid, in the form of grain and other nonnative foods, was taking priority over recipients traditional and cultural food ways ([Sullivan, 1970](#)). And so, as the debate rumbled between political and humanitarian goals, one commentator [Eulau \(1968\)](#) took a more philosophical view. In his opinion, the dual often ambiguous quandary appeared to benefit both domestic and foreign policy agendas of the donating country irrespective of motive, as he succinctly summarized:

If congressmen are willing to support a program such as Food for Peace, their private motivations or constituency interests, however selfish, do not defile, tarnish or befool its humanitarian consequences. [Eulau \(1968\)](#).

However, having said all, there was some good news. It seemed that powers that he did in fact understand the reality of releasing all these surplus on the international markets unimpeded by government interventionism. As such, it felt that the threat was so great that the CCP established a Consultative Subcommittee on Surplus Disposal (CSD) to closely watch the surpluses and consider their potential effects on the global market whether for good or bad (ActionAid, 2003; CCP, 2005a,b).

Elsewhere in the world, the late 1950s witnessed the birth of the European Community and what was quite possibly the worst ever famine in human history—The Chinese Great Leap Forward Famine.

3.11 The European economic community

The establishment of the European Economic Community was established in 1957. It was a remarkable moment as what it showed was the willingness of Member States to relinquish part of their sovereignty in favor of a supranational Europe. This was encouraging and negotiations the Messina Conference in 1955 was followed by a draft report on the creation of a European common market (1956). The creation of both the EEC and the Common Market was predicated on two main goals. The first was to reduce trade barriers within the community allowing the free movement of goods and services across borders. The second goal was simply looking to construct a politically unified Europe. These goals or objectives were further fleshed out over the years through a set of common policies. In the economic world, the treaty (the Treaty of Rome) aimed to promote the smooth development of European economic activity founded on free competition. This was predicated on the EEC's four freedoms including fifth—the free movement of people, services, goods, and capita (Europa 2007, 2010).

In the arena of food for all the Chinese fourth failed in a big way. During the period 1958–61, a famine ensued, and it lasted 3 years and has been quoted as being the biggest single event of its kind ever recorded in history.

3.12 The great leap forward famine (1958–61)

Billed as the largest famine of the 20th century and potentially of history the Chinese Great Leap Forward Famine lasted from 1958 to 61. It certainly was not a precedent either, as up to this point during the 20th century, China had already suffered several large famines over which it lost millions of its people. However, rather than being prepared or asking for external assistance, the political arena with its lack of transparency suppressed the full extent of the unfolding horror until it was just too late. Some say, at the heart of the problem was Chairman Mao Zedong's attempt to transform China's economic model from that of a traditional agricultural nation to one of a more industrial footing. To this end, peasants were instructed to leave their smallholdings and go to collectively work in large production farms. Furthermore, surplus workers were also instructed to produce steel and other necessities in small foundries. Indeed, such collectivization witnessed huge social upheaval and coupled with unfavorable weather conditions, as well as the overconsumption of foods in some quarters and the underinvestment in agriculture in others—the scene was set for widespread

famine on an unprecedented level. Fueling this tinderbox was the communist party's natural suppression of information. Couple this with the tendency to report only good news, the scale of the disaster ultimately kept the rest of the world in the dark. Eventually, when the leadership learned of the full scale of the problem it did little in mitigating events instead opting to further clamp down on the information flow. The tight control of the news flow was so effective and almost absolute that it took a further 20 years for the full extent of the atrocity to be told. The total death toll is difficult to estimate but some have placed estimates of at between 20 and 40 million lives. This results in the single greatest peacetime disaster of the 20th century and perhaps of history (Watson, 1999; Devereux, 2000; Ó Gráda, 2009).

Fully 35 years after the League of Nations incorporated the Declaration of the Rights of the Child, the United Nations finally revisited the idea.

3.13 Declaration of the rights of the child (1959)

After a decade or so of increasing activity regarding child welfare as well as the full realization of children's nutritional well-being (especially of the under-fives), the UN General Assembly adopted the Declaration of the Rights of the Child in 1959. This was the name given to a series of related proclamations or declarations over the years that recognized and accepted children's rights. It began in 1923 with Eglantyne Jebb's (Save the Children International Union (SCIU)) declaration of children's rights, which was ultimately taken by the League of Nations in 1924. Then in 1946, the SCIU merged with the International Union of Child Welfare. After that, in 1946, UNICEF replaced the United Nations Relief and Rehabilitation Administration (UNRRA) and he then continued to work for children's rights. And lastly in 1948, the special rights of children were once again articulated in Article 25(2) of the Universal Declaration of Human Rights. Thus, in 1959, the United Nations decided to formalize all these instruments into a special, nonbinding declaration, pronouncing that every child, no matter their family race, sex, religion, social origin, or political views, should be entitled to protection of rights vis-à-vis health, education, food, freedom, dignity, and discrimination among others (UN, 1959; UNICEF, 2009).

3.14 The freedom from hunger campaign

The creation of FAO's then Director-General B. R. Sen, the Freedom from Hunger Campaign (FFHC) was rolled out on a 5-year provisional mandate aimed to draw attention to the suffering of hunger and malnutrition in developing countries. It began in 1960 at a time when progress had been slow. The FFHC was designed to be a focal point for cooperation for international organizations, governments, and various NGOs alike. In this, it was successful and in March of 1963, the campaign concluded in the "World Freedom from Hunger Week" to attract even greater worldwide attention of the injustice of hunger and to the repeated concerns of population growth. A year later, at the request of President Kennedy, the American Freedom from Hunger Foundation was created to help mobilize support of the FAO's FFHC. The Foundation again by joining forces with Clifford E. Clinton's Meals for Millions organization and were both eventually combined (1979) to form the group Freedom from Hunger (Freedom from Hunger, 2010) (UN, 1963; SOFA, 2000) (Table 3.4).

TABLE 3.4 Key dates of the period: 1950 to 59.

Date	Key dates of the period
1950 The UN High Commissioner for Refugees (UNHCR)	The UN High Commissioner responsible for refugees elicited the knowledge and expertise of other UN organizations such as food production (FAO), education (UNESCO), health measures (WHO), and child welfare (UNICEF). It also cooperated closely with the World Food Program in providing for refugees (UNHCR, 2009).
1950 World Vision	World Vision founded by the Reverend Bob Pierce initially focused on orphans and other children in need South Korea. It then expanded throughout Asia then into more than 90 countries by the 2000s (World Vision, 2009).
1951 GATT 3rd round Torquay	The third GATT round in the UK (Torquay) tackled about 8700 tariff concessions (WTO, 2010).
1953 Foreign Agricultural Service (FAS) of the US Department of Agriculture (USDA)	Partnered with USAID, the FAS predominantly concentrated on the agribusiness aspect of humanitarian aid (National Archives, 1995; Otto, 1999; FAS, 2018).
1954 US Agricultural Trade Development and Assistance Act (Food for Peace)	US Federal Law established Food for Peace, which became the primary US overseas food assistance program (FAS, 2018).
1954 US Agency for International Development (USAID)	USAID is the US governments primary agency for humanitarian aid purposes and is the top provider of food aid in the world (UOVS, 2008; USAID, 2009a; USAID, 2010).
1954 The FAO Consultative Sub-Committee on Surplus Disposal (CSSD)	Established in 1954 as a subcommittee of the CCP, the CSSD's role was designated as that of oversight to monitor the disposal of agricultural surpluses used as food aid (ActionAid, 2003). Its remit also include disposing of surpluses in a way that avoided unnecessary displacement of commercial imports while simultaneously safeguarding export interests (ActionAid, 2003; CCP, 2005a,b).
1955–56 GATT 4th Round Geneva	In the 4th round of the GATT negotiations, they managed over \$2.5 billion in eliminated or reduced tariffs (WTO, 2010).
1957 The European Economic Community (EEC)	The European Economic Community (EEC) renamed the European Community EC in 1993 was established by the Treaty of Rome in 1957 (Europa 2007, 2010).
1957 The Joint Research Centre (JRC)	In 1957, while the Treaty of Rome established both the European Economic Community (EEC) and the European Atomic Energy Community (Euratom), it also created the Joint Research Centre, which was founded under the Euratom treaty. The JRC, however, expanded to include other fields it felt important to policy making. These included sciences, energy, security, and consumer protection offering research-based policy support, etc. (JRC, 2009).
1957 UK's Agriculture Act	As with the 1947 Act, the UK's 1957 Agriculture Act set out long-term pledges of price stability (UOR, 2009).
1958 Economic Commission for Africa (ECA)	The ECE was the first intergovernmental agency in Africa. It covered countries whose economic and social environment differed widely from each other and where many countries and dependent territories were among the poorest in the world (UNECE, 2000; EoN, 2009).

(Continued)

TABLE 3.4 Key dates of the period: 1950 to 59.—cont'd

Date	Key dates of the period
1959 UN Declaration of the Rights of the Child	In 1959, the UN General Assembly accepted the Declaration of the Rights of the Child, in turn offering special protection, facilities, and opportunities to develop mentally, physically, spiritually, morally, and in conditions of freedom and dignity (UN, 1959).

Source: Compiled from multiple sources: UN (1959); National Archives (1995); Otto (1999); UNECE (2000); Action Aid (2003); FAS (2018); CCP (2005a,b); UIOVS (2008); EoN (2009); JRC (2009); UNHCR (2009); UOR (2009); USAID (2009a,b,c); USAID (2010); WTO (2010).

Meanwhile in 1960, the FAO had commissioned a study looking at utilizing global food surpluses as humanitarian aid. Meeting in Rome the following year there was much discussion on this and other similar issues. In the end, the director of the United States Food for Peace Program, George McGovern, suggested to trial the multilateral food aid program over a 3-year period. The result was the World Food Program (WFP) (ODI, 2000; CCP, 2005a,b; Mousseau, 2005; Rucker, 2007; Walker, 2008).

3.15 World food program

Sponsored jointly by both the FAO and the United Nations, the World Food Program immediately took responsibility for humanitarian aid in the context of world hunger, thus becoming the frontline arm of the US international food aid program. In fact, more than this, the creation of a new body marked the start of a global multilateral food organization whose multiple aims looked to combat hunger, develop economic and social well-being, and provide humanitarian assistance in times of emergencies (WFP, 2008). So important was this work that in 1965 via parallel resolutions of both the FAO and the UN General Assembly established the World Food Program on an ongoing basis.

Previous to this, the WFP subsumed UNICEF's milk supplement programs among a few others. As a result, UNICEF adapted taking on relatively new nutrition programs such as the Applied Nutrition Projects (ANP). However, progress was slow and their effectiveness was duly questioned. The effectiveness of the individual projects approach was placed in doubt and as such program changed tack and attempted to apply a country-specific approach. However, once again it was found that too many similar projects lacked country-specific insight needed to implement programs more effectively (Ruxin, 1996).

3.15.1 The returning burden of surplus

During the early part of the 1960s, the United States Department of Agriculture (USDA) once again had to face the specter of agricultural overproduction. Continuing the practice which began in the late 1940s and which continued into the 50s, it was clear that the American government was facing a losing battle. The soil bank program of the previous decade seemed to do little more than take 28 million acres of farmland out of production while simultaneously paying farmers subsidies in lieu of grain crops on the land. However, the farmers

reinvested these subsidies into mechanization which resulted in the end in yet more surpluses. Consequently, under both administrations of Presidents Kennedy and Johnson, over-production once again became the primary objective of US farm policy. Policies were enacted to achieve multiple goals with the end result of finally dealing with the agricultural surpluses. In a two-pronged attack, more land was taken out of production, while measures were put in place in attempt to expand export markets for American agricultural products. It was also time that saw farmer's income grow from 50% to 75% compared with non-farmer's income (Reinhardt and Ganzel, 2003).

3.16 Hope holds out

The 1960s was considered a time of hope especially in the fight against hunger and malnutrition. Even agrarian reform was initially thought to be going well too. Yet there was a nagging feeling by certain people that the issues of malnutrition as well as economic and social development of the poorer nations were not going so well (SOFA, 2000).

In other news, the United Nations organization, in particular the WHO, FAO, and UNICEF, was complemented by new international players, initiatives, and policies that would unite all the players into one common cause. Indeed, the decade continued with two campaigns: firstly, the Freedom from Hunger Campaign and the World Food Program. Hot on the heels of these programs was the European Common Agricultural Policy and the United Nations World Food Conference.

3.17 The green revolution

The green revolution of the 1960s onward (discussed later) was in fact extension of the 19th century's chemical and industrial revolutions (Swaminathan, 1990; Borlaug 2000; Webb et al., 2008). What progressed to make the 1960s focal point the green revolution were the numerous advances in technology, mechanization, and genetic engineering. It was also the government's conducive policies of the time that made available inorganic fertilizers and advances in irrigation facilities. Not only were crop yields increasing quite considerably but also better soil management through new soil nutrient technologies aided by successful plant hybridization (Khush, 1999). Dwarf grain and rice varieties were grown to increase their yield compared with their biomass; this led to an increase in the harvest index, i.e., grain to straw ratio which saw prerevolution indices of 0.3 (30% grain and 70% straw) increase to green revolution indices of 0.5.

Meanwhile science saw new disciplines emerge, mature, and converge in the ever-growing field of biotechnology.

3.18 Single-cell proteins

The search for cheap high-protein foods was a challenge the United Nations and aid agencies hoped would come to fruition in the war against world hunger. Although the

agencies did not find an immediate solution, it did, however, expedite an increasing enthusiasm for alternative, somewhat unconventional sources of protein. Since ancient times, people had harvested *Spirulina*, the microbial filamentous blue green alga from lakes. It was then dried in the sun and used it for food. The focus in the 1950–60s, however, centered on other microbial sources of protein-rich food including yeast, algae, fungi, and bacteria. Indeed, yeasts importance as an alternative animal feed supplement was already commonly known. And indeed, during the First World War, the German government had already successfully used imported yeast to replace about half of the much-needed animal protein. Also during the Second World War, Germany had already successfully integrated yeast-based foods (yeast contains between 45% and 55% protein) such as sausages, soups, and the like into the nation's diet (Najafpour, 2007).

The idea was simple and elegant, if a way could be found to produce say yeast, for example, on a cheap, commercially practical scale and then the potential for yeast-based foods was limitless. However, yeast can feed on a number of foods (substrates) and the challenge was to find low cost substrates. Efforts focused on by-products such as molasses, cheese whey, starch, ethanol, and even hydrocarbon-based substrates including oil and natural gas (Ugaldea and Castrillo, 2002). This is not as far-fetched as it sounds. Indeed, researchers at British Petroleum (BP) led by Alfred Champagnat at BP's Lavera refinery in France (1962) developed a way that allowed yeast to feed on waxy n-paraffins (linear saturated hydrocarbons). Toprina, as the yeast protein was called, was cleared after nutritional and toxicological tests and by 1967 was being produced on an industrial scale supplying the agricultural industry with alternative poultry and cattle feed (Najafpour, 2007). In separate but related experiments, BP used methanol made from methane conversion (natural gas) and marketed it as "Pruteen," which in turn was used as a "milk" alternative in calf feeding. By now, the idea caught on around the world and several refineries or plants around the world had taken up the challenge and were between them producing around a quarter of a million tons of food yeast (Ward, 1977).

After much wrangling over the years regarding protein research, it was time to question the respective roles of kwashiorkor and marasmus.

3.19 Protein and the growing kwashiorkor–marasmus debate

By early 1960s, the Protein Advisory Group (PAG), already a somewhat influential group, always insisted that their interest lies in both protein and calorie intake. The reality, however, was slightly different in that the PAG tended to put protein research way above that of calorie and much to the chagrin of many nutritionists (McLaren, 1966). Cracks too were beginning to show up in the debate that protein was the primary protagonist in the problems of nutritional kwashiorkor. This was further evidenced in the Sixth Joint FAO/WHO Expert Committee on Nutrition in 1962 when its concerns were expressed that perhaps too much focus on protein was becoming a problem. The committee suggested that not only kwashiorkor but all aspects of the problem of protein calorie deficiency diseases would in fact benefit from a wider research focus (FAO, 1962). In strengthening this viewpoint, the Expert Committee talked of protein calorie malnutrition and also designated the term "protein calorie deficiency diseases" to include kwashiorkor and marasmus and all its sequelae. Further debunking

kwashiorkor's role of primacy in all things protein related was a study in Southern India supported by the WHO which found that marasmus essentially was twice as prevalent as kwashiorkor. Even Scrimshaw, a long-time proponent of proteins role in kwashiorkor and who had previously spent a great deal of effort and time in researching the problem of kwashiorkor, shifted focus toward marasmus and marasmic kwashiorkor (Scrimshaw, 2010).

However, despite these words of concern and shift in focus, protein research is still going strong. Building on this and the PAG's momentum, the FAO Expert Group met again in 1963 to once again reexamine protein requirements. Yet despite a plethora of studies, intake levels for children still remained divisive. Ultimately, not fully satisfied the committee finally adopted the factorial approach to calculating protein requirements. This involved the summation of base BMR values and then allowance for daily individual workload variability. Although it was later concluded by the 1971 expert group, armed with new information that the 1963 protein requirements had perhaps been incorrectly assessed due to the overestimation of nitrogen losses (Passmore, 1964; FAO/WHO, 1965; FAO/WHO, 1973; WHO, 1973).

At about this time, the third World Food Survey was completed and once again highlighted what appeared to be political malaise.

3.20 The third world food survey

After examining the previous World Food Survey 1952, there was general consensus by many FAO statisticians that the notion that nearly two-thirds of the population were malnourished had in fact vastly exaggerated the problem. Yet despite this exaggeration, the third World Food Survey (1963) still suggested that the global nutritional status was in fact still a major problem, with as much as between 10/15% and 50% considered to be suffering from hunger and malnutrition (FAO, 1963). This was still unacceptably high.

References

- ActionAid, 2003. Food Aid: An ActionAid Briefing Paper (ActionAid).
- Allen, L.H., 2000. Ending hidden hunger: the history of micronutrient deficiency control. In: Background Analysis for the World Bank-UNICEF Nutrition Assessment Project. World Bank, Washington, DC, pp. 111–130.
- Allen, L.H., 2003. Interventions for micronutrient deficiency control in developing countries: past, present and future. *The Journal of Nutrition* 133, 3875S–3878S. Supplement: Animal Source Foods to Improve Micronutrient Nutrition in Developing Countries.
- National Archives, 1995. Federal Records: Records of the Foreign Agricultural Service. National Archives of the United States, US National Archives.
- Aykroyd, W.R., 1956. FAO and nutrition. *Proc. Nutr. Soc.* 15 (01), 4–13.
- Belshaw, H., 1947. The food and agriculture organization of the united nations. *Int. Organ.* 1 (2), 291–306.
- Bikistow, G., 1998. Measuring regional variation in farm support: Wales and the UK, 1947–72. *Agric. Hist. Rev.* 46 (1), 81–98.
- Borchard, E., 1947. Intervention—The Truman doctrine and the Marshall plan. *Am. J. Int. Law* 41 (4), 885–888.
- Borlaug, N.E., 2000. The Green Revolution Revisited and the Road Ahead. 30th Anniversary. Lecture. The Norwegian Nobel Institute, Oslo.
- Brock, J.F., Autret, M., 1952. Kwashiorkor in Africa. *Bull. World Health Organ.* 5 (1), 1–71.
- Broughton, L., 1997. Lester B. Pearson's Role in the Formation of the Food and Agriculture Organization (FAO) and in Other United Nations Activities. United Nations Agency in Canada, Canada.

- Carpenter, K.J., 1994. *Protein and Energy: A Study of Changing Ideas in Nutrition*. Cambridge University Press, Cambridge.
- CCP, 2005a. Consultative SubCommittee on surplus disposal: fortieth report to the CCP. In: *Committee on Commodity Problems: Sixty-Fifth Session Rome, Italy, 11–13 April 2005*. Food and Agriculture Organisation, Rome.
- CCP, 2005b. A historical background on food aid and key milestones. In: *Committee on Commodity Problems: Sixty-Fifth Session*. Food and Agriculture Organisation, Rome.
- CEB, 2010. The Chief Executives Board (CEB): Overview. Retrieved 23rd March 2019, from: <http://www.unsceb.org/>.
- Chatfield, C., 1949. *Food Composition Tables for International Use: FAO Nutritional Studies No. 3*. Nutrition Division, FAO UN, Washington, DC, p. 56.
- Chatfield, C., 1954. *Food Composition Tables Minerals and Vitamins for International Use: FAO Nutritional Studies No. 11*. Nutrition Division, FAO UN, Washington, DC, p. 56.
- Crawford, D.M., 1949. United States foreign assistance legislation, 1947-1948. *Yale Law J.* 58 (6), 871–922.
- DAW, 2009. Division for the Advancement of Women. Retrieved 23rd Feb 2019, from: <https://www.un.org/development/desa/publications/2009-world-survey-on-the-role-of-women-in-development.html>.
- Devereux, S., 2000. *Famine in the Twentieth Century*. Brighton, Institute for Development Studies.
- Dimitri, C., et al., 2005. The 20th Century Transformation of U.S. Agriculture and Farm Policy. *Electronic Information Bulletin* Number 3.
- ECOSOC Number and Social Council, 1947. 1946–1947 First to Fifth Sessions 1947. Retrieved 1st June 2019, from: https://library.un.org/sites/library.un.org/files/itp/1430-201404101302204694093_0.pdf.
- EoN, 2009. *Economic and Social Development: Regional Commissions the Encyclopedia of the Nations*. United Nations, New York.
- ESCAP, 2010. *United Nations Economic and Social Commission for Asia and the Pacific: General Description*. Retrieved 28th March 2019, from: <https://www.unescap.org/about>.
- Eulau, H., 1968. Book reviews: the politics of food for Peace. By peter A. Toma. *Political Res. Q.* 21, 530–532.
- Europa, 2007. *Treaty Establishing the European Economic Community, EEC Treaty*. EU PO, European Union Publications Office.
- Europa, 2010. Website of the European Union. The EU at a Glance. Retrieved 21st June 2019, from: http://europa.eu/index_en.htm.
- FAO, 1946. *World Food Survey*. Food and Agriculture Organisation, Washington, D.C.
- FAO, 1947. *Report of the First Session of Council of FAO 4-11 November 1947*. Food and Agriculture Organisation, Washington D.C., p. 35.
- FAO, 1950. *Calorie Requirements. Report of the Committee on Calorie Requirements 1949: FAO Nutritional Studies No. 5*. Food and Agriculture Organisation, Washington, DC.
- FAO, 1955. *Protein Requirements. Report of the F.A.O. Committee. FAO. Nutritional. Studies No. 16*. Food and Agriculture Organisation, Rome.
- FAO, 1957a. *Calorie Requirements. Report of the Second Committee on Calorie Requirements: FAO Nutritional Studies No. 15*. Food and Agriculture Organisation, Rome.
- FAO, 1957b. *Report of the Conference of FAO. Conference Reports*. Food and Agriculture Organisation, Rome.
- FAO, 1958. *National Food Reserve Policies in Underdeveloped Countries*. Food and Agriculture Organisation, Rome.
- FAO, 1962. *Joint FAO/WHO Expert Committee on Nutrition. Sixth Report. World Health Organization Technical Report Series No. 245*. Food and Agriculture Organisation/World Health Organization, Rome, Geneva, p. 68.
- FAO, 1963. *Third World Food Survey, FFHC Basic Study No. 11*. Food and Agriculture Organisation, Rome, p. 102.
- FAO, 1995. *Dimensions of Need: An Atlas of Food and Agriculture*. Food and Agriculture organisation, Rome.
- FAO, 2001. *Food Balance Sheets: A Handbook*. Food and Agriculture Organisation, Rome.
- FAO, 2002. *Food, Nutrition and Agriculture. FAO Food and Nutrition Division*, Rome.
- FAO, 2003. *Food Energy – Methods of Analysis and Conversion Factors. Fao Food and Nutrition Paper 77*. Food and Agriculture Organisation.
- FAO/WHO, 1965. *Joint FAO/WHO Expert Committee on Protein Requirements - Nutrition Studies No. 37*. FAO/WHO, Rome.
- FAO/WHO, 1973. *FAO/WHO AD HOC Committee of Experts on Energy and Protein: Requirements and Recommended Intakes*. Food and Agriculture Organisation, Rome.
- FAS, 2018. *Timeline of U.S. Agricultural Trade and Development*. Retrieved 12 Jan 2019, from: <https://www.fas.usda.gov/about-fas>.

- Freedom from Hunger, 2010. Website of the Freedom from Hunger. Retrieved 15th June 2019, 15th June 2010, from: <http://www.freedomfromhunger.org/>.
- GATT, 1952. The History Structure and Functions of the ICCICA. World Trade Organisation, Washington DC.
- GATT, 1960. General Agreement on Tariffs and Trade: Seventeenth Session; Disposal of Commodity Surpluses. UN General Agreement on Tariffs and Trade, New York.
- Gibson, M., 2016. The Feeding of Nations: Re-defining Food Security for the 21st Century. CRC Press, Boca Raton, Florida.
- Gillespie, J.A., 2003. International organizations and the problem of child health, 1945-1960. *Dynamis* 23, 115–142.
- Goldsmith, G.A., 1955. The kwashiorkor syndrome. *Am. J. Clin. Nutr.* 3 (4), 337–338.
- Goodrich, L.M., 1947. From league of nations to united nations. *Int. Organ.* 1 (1), 3–21.
- Henry, C., 2005. Basal metabolic rate studies in humans: measurement and development of new equations. *Public Health Nutr.* 8 (7A), 1133–1152.
- Hoffmann, S., Maier, C. (Eds.), 1984. The Marshall Plan: A Retrospective. Westview Press, Boulder.
- House of Commons, 1946. House of Commons Debates, 25 January 1944: UNRRA Winding up. House of Commons, 430: cc1979-2018.
- IANWGE, 2010. UN Interagency Collaboration: History of the Collaboration on Women and Gender Equality from: <https://womenwatch.unwomen.org/>.
- IGC, 2009. Grains Trade and Food Security Cooperation: The International Grains Agreement. Retrieved 21st Feb 2019, from: <https://www.igc.int/en/>.
- ITO, 1948. ITO press release: speech to be delivered to the chief delegate of China at the closing session of the Havana conference. In: UN Conference on Trade and the Employment. International Trade Organisation, Havana.
- JRC, 2009. European Commission Joint Research Centre: History. Retrieved 22nd June, 2019.
- Keusch, G.T., 2003. The history of nutrition: malnutrition, infection and immunity. *J. Nutr.* 133, 336S–340S.
- Khan, K., 1982. The Law and Organisation of International Commodity Agreements. Martinus Nijhoff, Hague.
- Khush, G.S., 1999. Green revolution: preparing for the 21st century. *Genome* 42 (4), 646–655.
- Mclaren, D.S., 1966. A fresh look at protein-calorie malnutrition. *The Lancet* 288 (7461), 485–488.
- McMillan, R.B., 1946. World food survey" - a report from F.A.O. *Rev. Mark Agric. Econ.* 14 (10), 372–378.
- Mezzalama, F., et al., 1999. Review of the Administrative Committee on Coordination and its Machinery. UN Joint Inspection Unit, Geneva, p. 31.
- Morrison, A.V., 1986. GATT's Seven Rounds of Trade Talks Span More than Thirty Years - General Agreement on Tariffs and Trade. *Business America*, Swanton USA, pp. 8–10.
- Mousseau, F., 2005. Food Aid or Food Sovereignty? Ending World Hunger in Our Time. Oakland Institute, USA.
- Najafpour, G.D., 2007. Biochemical Engineering and Biotechnology. Elsevier, Netherlands/Oxford.
- NAL, 2010. Consumers Guide. N. A. Library, USDA the National Agricultural Library. Agriculture Fact Book, USDA.
- ODI, 2000. Briefing paper. In: Reforming Food Aid: Time to Grasp the Nettle. Overseas Development Institute, London.
- Ó Gráda, C., 2009. Famine: A Short History. University Presses of California, Columbia and Princeton. Princeton.
- OPSI, 2007. Agriculture Act 1947. UK Parliament. HMSO: Office of Public Sector Information.
- Otto, J.S., 1999. The Final Frontiers, 1880-1930: Settling the Southern Bottomlands. Greenwood Press, Westport USA.
- PAG, 1967. PAG Bulletin Number 7: II. Articles - Development of Supplementary Food Mixture (CSM) for Children. World Health Organisation, Geneva, p. 24. Protein Advisory Group News Bulletin.
- Passmore, R., 1964. An Assessment of the Report of the Second Committee on Calorie Requirements (FAO, 1957). Food and Agriculture Organisation, Rome.
- Périsse, J., 1981. Joint FAO/WHO/UNU Expert Consultation on Energy and Protein Requirements: Past Work and Future Prospects at the International Level. Food and Agriculture Organisation, Rome.
- POPIN, 1994. Background Document on the Population Programme of the UN. United Nations Population Fund, Geneva.
- Nobel Prize, 2010. UNICEF: Achievement and Challenge. Retrieved 2019, from: http://nobelprize.org/nobel_prizes/peace/laureates/1965/unicef-lecture.html.
- Reinhardt, C., Ganzel, B., 2003. A History of Farming. Living History Farm.
- Rucker, A., 2007. Key players in food aid. *eJournal USA*.

- Ruxin, J.N., 1996. *Hunger, Science, and Politics: FAO, WHO, and Unicef Nutrition Policies, 1945 -1978*, Chapter II the Backdrop of UN Nutrition Agencies, by Joshua Nalibow Ruxin. University College London. PhD, London.
- Scott, S.L., 1951. The military aid program. *Ann. Am. Acad. Pol. Soc. Sci.* 278 (47).
- Scrimshaw, N.S., 2010. History and early development of INCAP. *J. Nutr.* 140 (2), 394–396.
- Scrimshaw, N.S., et al., 1959. Interactions of nutrition and infection. *Am. J. Med. Sci.* 237 (3), 367–403.
- SOFA, 2000. *The State of Food and Agriculture 2000*. Food and Agriculture Organisation, Rome.
- Sullivan, R.R., 1970. Politics of altruism - introduction to food-for-peace partnership between united-states-government and voluntary relief agencies. *West. Political Q.* 23 (4), 762–768.
- Swaminathan, M.S., 1990. Sir John Crawford Memorial Lecture: Changing Nature of the Food Security Challenge: Implications for Agricultural Research and Policy. Consultative Group on International Agricultural Research, Washington.
- Sweetser, A., 1946. From the league to the united nations. *Ann. Am. Acad. Pol. Soc. Sci.* 246, 1–8.
- Toma, P.A., 1967. *The Politics of Food for Peace*. University of Arizona Press, Tucson.
- Ugaldea, U.O., Castrillo, J.I., 2002. Single cell proteins from fungi and yeasts. *Applied Mycology and Biotechnology* 2, 123–149.
- UN, 1945. Charter of the United Nations, 24 October 1945, 1 UNTS XVI. U.N., United Nations.
- UN, 1948. Part A of general assembly resolution 217 (III). In: *International Bill of Human Rights: Universal Declaration of Human Rights UN. General Assembly (3rd Sess 1948-1949: Paris)*. United Nations. Resolution 217.
- UN, 1959. Declaration of the Rights of the Child. U.N., United Nations. A/RES/1386 (XIV).
- UN, 1963. Operational Files of the Secretary-General: U Thant: Speeches, Messages, Statements, and Addresses - Not Issued as Press Releases. United Nations, New York. U. Secretariat.
- UNECE (2000). "Overview of the Economic Commission for Africa." Retrieved 23rd June 2019, from: <http://www.unece.org/>.
- UNECE, 2010. Economic Commission for Europe: Inception. Economic Commission for Europe. Retrieved 21st March 2019, from: <http://www.unece.org/info/ece-homepage.html>.
- UNHCR, 2009. About Us: Basic Facts. Retrieved 13th April 2019, from: <http://www.unhcr.org.au/basicfacts.shtml>.
- UNICEF, 2005. United Nations Childrens Fund. Retrieved 30 Jan 2019, from: http://www.unicef.org/about/who/index_history.html.
- UNICEF, 2009. The Convention on the Rights of the Child. Retrieved 30 Jan 2019, from: <https://www.unicef.org/about-us/70-years-for-every-child>.
- UOR, 2009. University of Reading: Agriculture, Policy and Development, History of Agriculture. Retrieved 4 June 2019, from: <http://www.ecifm.rdg.ac.uk/history.htm>.
- UOVS, 2008. Demand and Supply Theory.
- USAID, 2009a. Food for Peace. Retrieved 4th Jan 2019, from: <https://www.usaid.gov/who-we-are/organization/bureaus/bureau-democracy-conflict-and-humanitarian-assistance/office-food>.
- USAID, 2009b. The Marshall Plan. Retrieved 12th Jan 2019, from: <https://www.usaid.gov/who-we-are/usaaid-history>.
- USAID, 2009c. United States Agency for International Development: History. Retrieved 12th May 2019, from: <https://www.usaid.gov/who-we-are/usaaid-history>. http://www.usaid.gov/about_usaid/usaaidhist.html.
- USAID, 2010. Our Work: A Better Future for All. US Agency for International Development. Retrieved 12th Jan 2019, from: <https://www.usaid.gov/what-we-do>.
- USDA, 2009. History of the. U.S. Department of Agriculture USDA. Retrieved 12th Feb 2019, from: <https://www.nal.usda.gov/topics/usda-history>.
- USHMM, 2010. US Holocaust Memorial Museum: Politics - UNRRA. Retrieved 21st Feb 2019, from: <https://www.ushmm.org/learn>.
- Walker, P., 2008. The Origins, Development and Future of the International Humanitarian System: Containment, Compassion and Crusades. ISA's 49th Annual Convention, Bridging Multiple Divides. International Studies Association (ISA), San Fransisco, CA.
- Ward, W.A., 1977. Calculating Import and Export Parity Prices. Training material of the Economic Development Institute, Washington D.C, World Bank. CN-3.
- Watson, F., 1999. One hundred years of famine - a pause for reflection. *Field Exchange* (8), 20–23.
- Watson, J.D., Crick, F.H., 1953. Genetic implications of the structure of deoxyribonucleic acid. *Nature* 171, 964–967.

- Webb, P., et al., 2008. More food, but not yet enough: 20th century successes in agriculture growth and 21st century challenges. In: Food Policy and Applied Nutrition Program. School of Nutrition Science and Policy, Tufts University, Boston, Massachusetts.
- Weir, C., 1952. Dollar exports in the Marshall plan period. *J. Int. Aff.* 28 (1), 9–14.
- Weisell, R.C., 1995. In: Lupien, J.R., Richmond, K., Randell, A., et al (Eds.), Food, Nutrition and Agriculture: FAO Celebrates 50 Years - Expert Advice on Energy and Nutrient Requirements - an FAO Tradition. Food and Agriculture Organisation, Rome.
- Weisell, R., 2002. Measurement and assessment of food deprivation and undernutrition: Part IV - summary of the draft findings of the joint FAO/WHO/UNU expert consultation on human energy requirements. In: International Scientific Symposium. FAO, Rome.
- WFP, 2008. The World Food Programme: The First 45 Years. World Food Programme. Retrieved 25 April 2019, from: <https://www.wfp.org/history>. <https://www.wfp.org/overview>.
- WHO, 1946. Official Records of the World Health Organisation No1 Minutes of the Technical Preparatory Committee for the International Health Conference. World Health Organisation, Paris, p. 80.
- WHO, 1950. JOINT FAO/WHO expert committee on nutrition: report on the first session 1949 - technical report series No. 16. In: World Health Organization Technical Report Series No. 16. World Health organisation, Geneva, p. 24.
- WHO, 1951. JOINT FAO/WHO expert committee on nutrition: report on the second session 1951 - technical report series No. 44. In: World Health Organization Technical Report Series No. 44. World Health organisation, Geneva, p. 24.
- WHO, 1953. JOINT FAO/WHO expert committee on nutrition: third report 1953 - technical report series No. 72. In: World Health Organization Technical Report Series No. 72. World Health organisation, Geneva, p. 24.
- WHO, 1955. JOINT FAO/WHO expert committee on nutrition: fourth report 1953 - technical report series No. 97. In: World Health Organization Technical Report Series No. 97. World Health organisation, Geneva, p. 24.
- WHO, 1958. The First Ten Years of the World Health Organization. WHO, Geneva. Ch 22 - Nutrition.
- WHO, 1972. Nutrition: a review of the WHO programme. II. WHO (World Health Organ.) Chron. 26 (5), 195–206.
- WHO, 1973. Energy and protein requirements: report of a joint FAO/WHO ad hoc expert committee - technical report series No. 522. In: WHO Technical Report Series No. 522 FAO Nutrition Meetings Reports Series No. 52. World Health organisation, Geneva, p. 24.
- WHO, 1998. Fifty Years of the World Health Organization in the Western Pacific Region, 1948–1998: Report of the Regional Director to the Regional Committee for the Western Pacific. Forty-Ninth Session. World Health Organization - Regional Office for the Western Pacific, Manila, Philippines.
- WHO, 2010. Website of the World Health Organisation. Retrieved 2nd April 2019, from: <http://www.who.int/>.
- Williams, A.J., 2005. Reconstruction' before the Marshall plan. *Rev. Int. Stud.* 31 (3), 541–558.
- World Vision, 2009. Website of World Vision. Retrieved 23rd May 2019, from: <http://www.worldvision.org.uk/>.
- WTO, 2010. Understanding the WTO: Basics - the GATT Years: From Havana to Marrakesh. Retrieved 30 March 2019, from: http://www.wto.org/english/thewto_e/whatis_e/tif_e/fact4_e.htm.
- Wu Leung, W.-T., et al., 1968. Food Composition Table for Use in Africa. U.S. Department of Health/FAO, Maryland, Rome.