

UK PREPAREDNESS FOR FUTURE FOOD SYSTEM SHOCKS

A THOUGHT EXPERIMENT

CONTENTS

- The UK food system: Building resilience
- Learning from Covid-19 lockdown unpreparedness
- Buffer contingency stocks: How the system could work
- What stocks to choose, what *not* to choose and why
- Resourcing food system resilience: Trust, governance, economics and the value of life

ENDNOTE ON NUTRIENT SUPPLIES

PREPAREDNESS

What metric would you choose to measure the scales of preparedness and severity? And where would you put the UK on the scales you've chosen?

If there aren't sufficient supplies of safe, nutritious food for everyone in the supply system, who should go without?

A well-managed buffer contingency stock system would make the UK better prepared for future system shocks. But is it feasible? If not, what would be?

SEVERITY





THE UK FOOD SYSTEM BUILDING RESILIENCE

The impact of the Covid-19 lockdown was the most serious, sudden shock to the UK food system since World War II.

Post-Brexit trade relationships may soon send another shock through the system. Even if not, climate change & the global competition for safe, nutritious food will. As a part of building UK food system resilience, this paper puts forward:

- The UK sets up a network of regionally-controlled buffer contingency stocks of safe, nutritious food.
- An outline for the role of Government, other governance issues and economic models to justify the expenditure.

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“Our food system was ill-prepared for Covid-19.

The UK population has no option but to trust their Government to do what’s necessary for everyone to have access to sufficient supplies of safe, nutritious food.

Many people didn’t have access pre-Covid, a situation that has become dramatically worse since lockdown.

The pandemic has, too, put other grave threats on the UK food system.

The UK food supply system is now worse prepared for any future shocks and instabilities.



LEARNING FROM COVID-19 LOCKDOWN UNPREPAREDNESS

What food system fragilities and vulnerabilities were exposed by the Covid-19 lockdown?

Pre-Covid, many Government and policy decision-makers had not taken food security seriously. Few grasped the scale and complexity of the food network, or the global competition for safe, nutritious supplies.

What can we learn from our unpreparedness?



FIVE LESSONS OF COVID

- The food supply system is fragile.
- Local authorities are well-nigh powerless in the face of food supply failure to a large population.
- The UK has no buffer contingency stocks of safe, nutritious food.
- Food security risk and resilience planning is not apparent, either nationally or regionally.
- It's unclear how HMG will fulfil its responsibility for UK food security.

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FOOD SYSTEM PREPAREDNESS FOR COVID-19

We identified 13 features of our pre-Covid food system that led to its lack of preparedness. Two have caused great suffering:

- Diet-related morbidities and their strong association with severe illness and death from Covid-19.
- Many UK citizens lived with food insecurity before Covid-19, a situation now affecting millions more. Now, as then, HMG isn't fulfilling its responsibilities under the 1996 Rome Declaration.

FRAGILITIES EXPOSED IN THE RESPONSE TO COVID-19

Neither the commercial or third sector is equipped to respond to hunger, or to supply employees/key workers with healthy meals. There is no buffer food capacity, nor informal supply network data.

The fragility of JIT supply systems was masked by Brexit stock-piling over preceding months and, by luck, avoidance of pinch point events (e.g. CO₂ shortages, delays at Dover). There are still capacity and price issues with sea and air-freighted produce.

Add in 30% capacity loss with the shutdown of food services, the lack of connectivity between B2B and B2C supply systems, capacity limits to on-line retail delivery, costly delivery charges to on-line take-away suppliers, pre-Covid worker precarity across the sector now resulting in significant job losses, and the effects of loosening regulations and associated non-compliance including food fraud, unsafe food, agri-labour shortages and exploitation.

With all the above, plus the urgency to distribute food, corporate triple bottom line commitments came in a poor second place.



diet-related morbidities



food insecurity



post-Brexit food trade

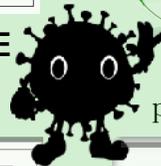


the melting of the Arctic ice-cap

Future shocks ahead: Covid-19 surges? Post-Brexit trade arrangements?
Extreme weather events? Crop pathogen infestations? Geopolitics?



FOOD SYSTEM RESILIENCE BUFFER CONTINGENCY



- Food network robustness engineered into the commercial JIT system through ...
- Regionally-controlled depots with x -days supplies of preserved fresh produce
- Providing a nationwide buffer contingency, underpinned by Government policy.
- Regional buffer contingency stock facilities increase food resilience, mitigate food supply risks *and*
- Enable HMG to fulfil its responsibility for UK food security, especially in times of crisis.

Food security exists when all people, at all times, have access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.

1996 ROME DECLARATION

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BUFFER CONTINGENCY STOCKS: HOW THE SYSTEM COULD WORK

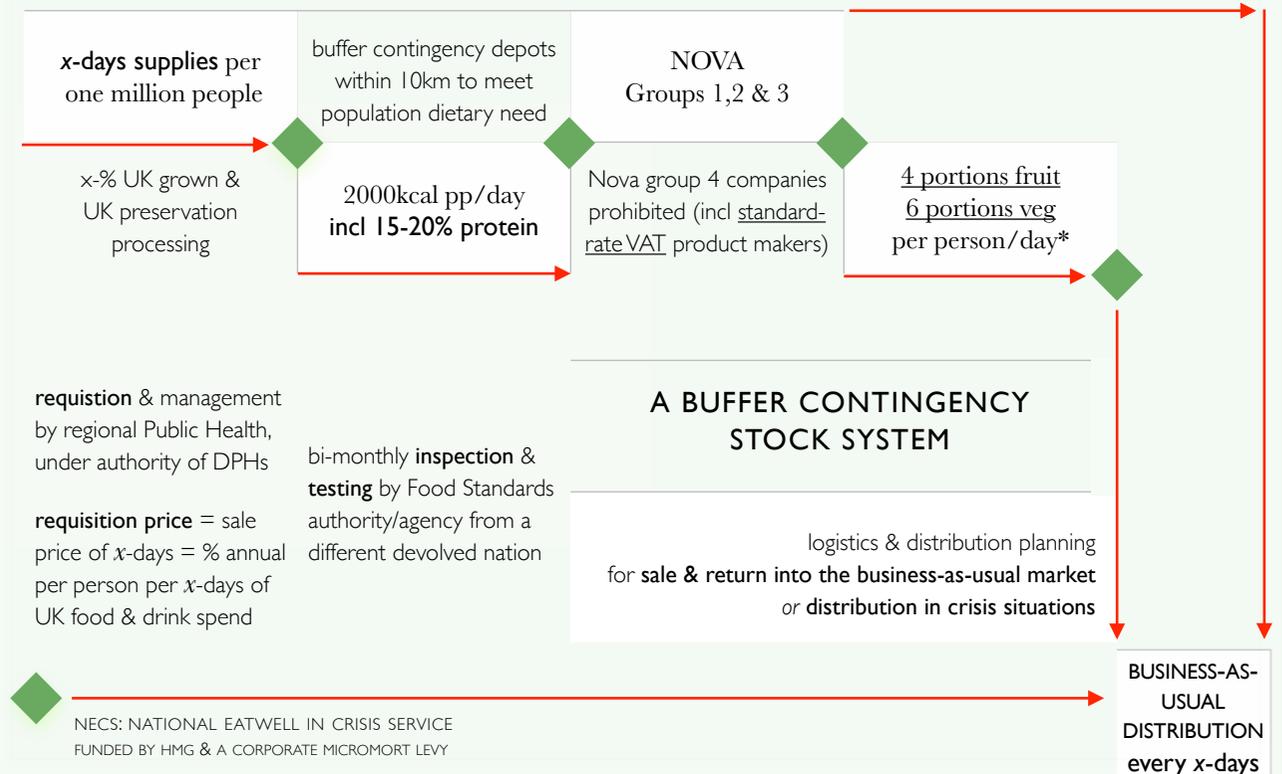
A buffer contingency stock of safe, nutritious food begs complicated questions about **governance**: Who owns what and when? What are owner responsibilities, and to whom would they be accountable? What should the ratio of shared set-up and running costs be from Government, the corporate micromort levy and insurance? There are also questions about food **resilience**: e.g. How would quotas for UK primary production & processing affect long-term resilience?



What incentives, including R&D funding & investment, would increase processing capability and capacity on or near primary production?

Would local Public Health responsibility for buffer procurement enable more of their population to access safe, nutritious food? How would informal food supply networks change? And the role of the third sector?

How would this precedent of prohibiting the activities of some corporations affect the urban foodscape? And Government-funded research agendas, too?



* see end note

WHAT STOCKS TO CHOOSE NOVA CLASSIFICATION SYSTEM

PRESERVED FRESH PRODUCE STOCKS i.e. NOVA GROUPS 1, 2 & 3

NOVA GROUP 1: UN- or MINIMALLY PROCESSED edible parts of plants, fungi, algae or from animals, or altered in simple ways leaving their composition largely intact and are done to extend their life (e.g. drying, crushing, grinding cooking, heating, chilling pasteurisation, vacuum packaging).

NOVA GROUP 2: CULINARY INGREDIENTS Processed culinary ingredients used in the preparation, cooking or seasoning of foods (e.g. fats such as oils and butter, sugars and related products such as maple syrup, and salt), rarely consumed by themselves.

NOVA GROUP 3: PROCESSED FOODS are made by adding Group 2 ingredients to Group 1 foods using preservation methods such as bottling, canning, drying, smoking or fermentation to increase the durability of Group 1 foods and modify or enhance their sensory qualities and palatability.

WHAT STOCKS NOT TO CHOOSE
NOVA GROUP 4: ULTRA-PROCESSED PRODUCTS are recent industrial creations designed to appeal to palates. Typically, their manufacture begins with the separation of whole foods into components (e.g. starch, sugars, fats, oils, protein and fibre) from mostly industrially farmed high yield crops (e.g. corn, soya, wheat, sugar cane/beet) and ground or pureed carcasses of intensively farmed livestock. Some undergo chemical modification (e.g. hydrolysis or hydrogenation) then more processing (e.g. pre-frying extrusion, moulding) and combined with chemicals (many from the petroleum industry), creating brightly packaged, low-cost, long shelf-life, ready-to-consume, powerfully branded products. A significant subset of Group 4 products/ingredients are drug-foods.

OUR APPETITE FOR PROTEIN PROTEIN LEVERAGE HYPOTHESIS

How do, say, slime moulds, locusts, wild dogs or monkeys forage for a healthy diet? It's a balancing act for them, as it is for us. Their appetites, as ours, drive them to eat a precise ratio of protein-to-kcal.

For us humans: Children, adolescents & 40-65 year olds need 15% calorie intake of protein. For young adults up to 40 years old, it's 18%. Pregnant & breastfeeding women need 20% to make the extra tissue & milk. For >65s, it's also 20% as older people process protein less efficiently than most.

This three-step example shows how to calculate the amount of protein by weight that a person requires:

EXAMPLE: An inactive 74-year old man

STEP ONE: He's 190cm tall & weighs 110kg. This calculator measures he needs 2300kcal/day.

STEP TWO: He's 74 years old, so a 20%-er. Hence he needs 460kcal of his diet to be protein.

STEP THREE: As each gram of protein is 4 kcal, he needs 115g protein per day.

What if he reaches his 2300kcal before he's eaten 115g protein?

The Protein Leverage Hypothesis says he will carry on eating until he does.



Animals use protein to build & repair tissue make enzymes, hormones, et al. They can't store it, so are driven to forage & eat what their body signals they need.

All animals use simple heuristic rules in a complex foraging landscape to find the food they need to survive

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INFORMS US WHAT NOT TO CHOOSE NOVA GROUP 4 PRODUCTS

In today's food sector landscape, human appetites are all too often driven askew by corporations responding to commercial challenges and opportunities:

COMMERCIAL CHALLENGE (A)

To beat competitors and reduce costs.

COMMERCIAL CHALLENGE (B)

As the requirement for calories, nutrients and fibre in any population group is static, the *only* way to increase demand is to drive different foraging choices.

COMMERCIAL OPPORTUNITY 1

Animals eat until their daily protein intake is met; e.g. the man in the example is driven to eat 115g *even if that means him under-eating or over-eating calories*.

COMMERCIAL OPPORTUNITY 2

Although protein is expensive, appetites can be fooled by 'fake' protein umami enhancers, but, crucially, our gut can't be. Low-to-zero fibre content heightens initial taste. (Fibre fills you, definitely *not* in the corporate interest. It also enriches the gut biome and keeps you regular, neither a commercial concern.) *And* there are the addictive effects of drug-foods.

A NOVA GROUP 4 FORAGING LANDSCAPE

Companies making and promoting low fibre, low protein, palate stimulating, dopamine releasing, obesity inducing products drive a commercially-virtuous demand cycle.

Bigger consumers mean more tissue requiring yet more protein. If this higher protein need isn't met, product demand rises which, if met with yet more low protein products, the body signals the appetite to eat more and more in a vain attempt to meet its protein requirement.

Corporations that make or promote any NOVA 4 products must be prohibited from buffer contingency stock planning & fulfilment.



MORE INFORMATION

NOVA CLASSIFICATION SYSTEM

Carolos Montiero et al: [Ultraprocessed foods, diet quality and health using the NOVA classification system](#). FAO, 2019

PROTEIN LEVERAGE HYPOTHESIS (PLH)

The previous page is a highly compressed version of a unique synthesis of the appetites-protein-leverage-meets-ultra-high-processed scenario from [Eat like the animals](#) (2020) by David Raubenheimer & Stephen Simpson.

[MODERN] MONETARY THEORY (MMT)

Stephanie Kelton: [Learn to love trillion dollar deficits: Our country's myth about federal debt explained](#). New York Times, 9th June 2020. See also her book, [The deficit myth](#) (2020) and this [Wikipedia entry](#) about MMT & critiques of it.

QALYs AND DALYs

This [European Food Information Council](#) page.

VALUE OF STATISTICAL LIFE (VSL)

Tim Harford: [How do we value statistical life?](#) FT (free to read), 3rd April 2020

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RESOURCING FOOD SYSTEM RESILIENCE TRUST, GOVERNANCE, ECONOMICS & THE VALUE OF LIFE

TRUST & GOVERNANCE

The Government has the ultimate responsibility to ensure everyone has access to sufficient supplies of safe, nutritious food as laid out under the 1996 Rome Declaration.

In today's commercial food-scape citizens have no option but to trust their Government to use any or all these powers to fulfil this responsibility:

- ❖ **R&D investment** (e.g. technologies for eco micro-climates, plant & insect protein production, robotics, crop pathogen control, dark kitchens for mass catering, fresh produce & protein processing and storage equipment and facilities).
- ❖ Devolution of **powers to regional anchor-institutions for public goods**, such as local authorities, universities, NHS hospitals & clinics for education, health service plus **food inspection and testing and food supply capacity facilities**.
- ❖ Imposition of **quota restrictions** (e.g. on UK grown and/or imports, such as sugar or other commodities associated with diet-related morbidities).
- ❖ In addition to existing **regulation**, they could *inter alia* prohibit or limit the use and promotion of ingredients (e.g. trans-fats, additives, drug foods), and prescribe nutrient content (following animal feed and pet food precedents).
- ❖ **Fiscal powers** to raise **levies**, and use other means to mitigate rising nutrient prices (incl the above *and* global competition); e.g. **taxation and NICs, minimum wage, public sector pay, State pension, social security, free or subsidised meals services** (e.g. school, FE, HE & work canteens, Sure Start, medical & health care).
- ❖ **Monetary controls**: asks to a central bank: e.g. quantitative easing or monetary financing; i.e. increasing money supply.

ECONOMICS

Most Government spending decisions are framed through the question *How will we pay for this?* This question, however, wasn't asked about Rishi Sunak's decision to pay a significant swathe of the UK wage bill last March. Nor was it asked when money was poured into building Nightingale hospitals and medical research for Covid-19 vaccines and treatments.

Chancellor Rishi Sunak asked the Bank of England a question right at the heart of monetary theory, as did [Alistair Darling in 2009](#) and [JFK to Congress in 1961](#): *How are we going to resource what we want to do?*

In preparing the UK food supply system for the next crisis, only the Government has the means as well as the power to take on the responsibility for buffer contingency stocks of safe, nutritious food. Nonetheless, it must provide justification of the expenditure involved in making it happen.

THE VALUE OF LIFE

It could be argued that the following two models, used together, could justify such expenditure. The first is familiar in health service provision, the second less widely known:

- ➔ **QALYs** (Quality-Adjusted Life Year) is a measure of years lived in perfect health gained, and **DALYs** (Disability-Adjusted Life Year) is a measure of years in perfect health lost.
- ➔ **Value of Statistical Life (VSL) and micromorts**: How do you put a price on a life? It's priceless, thus incalculable. VSL is instead a risk-based calculation, the value of averting deaths. It is measurable in 'micromorts', each unit being a one-in-a-million chance of death; e.g. the US Environment Protection Agency, in today's money, values a statistical life at \$10m, or \$10 per micromort averted.

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ENDNOTE

- A healthy population is key element of the UK's preparedness for the next crisis.
- A person's physical, mental and cognitive health depends on a having highly nutritious diet.
- Research indicates a healthy diet requires 10-a-day portions of fruit and veg, with extra benefit from more veg than fruit (hence our 4:6 ratio).
- Ten portions of fruit and veg per person per day = 70 portions per week.
 - For a million people, this means 70m portions every week, or 3.6 billion per year.
 - For the UK population (66.5m), it is 465.5m portions a week, or 24.2 billion per year.
- Animal & plant fresh produce is nutrient dense *and* provides calories, but most is highly perishable.
 - Thus this stock needs preservation processing before storage, which could include preparation of composite meals.

ON NUTRIENT SUPPLIES

If there aren't sufficient supplies of safe, nutritious food for everyone in the supply system, who should go without?

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