

(A recipe produced for FOODSCAPES,
the 2023 Spanish Pavillion at the Venice Biennale
curated by Eduardo Castillo-Vinuesa and Manuel Ocaña)

Traces of almojábanas

Lucía Jalón Oyarzun

“Know that the almojábana is not composed of one cheese alone, but of two, namely, cow and sheep, because if you make it with sheep cheese alone, it falls apart and the cheese comes out of it and runs, and if you make it with cow cheese, it binds and lets the water run and makes a single body and its parts do not separate. The basis for making it is to bind the two cheeses and that there is a quarter of cow's milk and three quarters of sheep's milk [...] So do the people of our land in the west of Al-Andalus, as in Cordoba and Seville, Jerez and other cities in the west of the country.

How it is made

You knead wheat flour or semolina with some yeast into a well-made dough and sprinkle it with water little by little until it breaks up, and if you sprinkle it with fresh milk, instead of water, it is better and easier, as long as you do it with your hand; it is then spread out, not in the manner of honeyed dough but stronger, and lighter than with greased dough; when yeast begins to enter the dough, the fryer is set on the fire with plenty of oil, so that what is fried with it will be well soaked; then the hand is dipped in water and a piece of the dough is cut, inside it you put the same amount of that crushed cheese and you press it with your hand, and what comes out and slips from the hand, is gently picked and put in the fryer, while the oil boils, and when it has browned, it is taken out with an iron hook prepared for this purpose and put in an iron pan, similar to a high filter, raised above the fryer until its oil drips; then it is put in a large bowl and sprinkled with lots of sugar and ground cinnamon. There are those who eat it with honey or rose syrup, and it is the best thing to eat.”

From an anonymous thirteen century Arab manuscript from Al-Andalus, translated into Spanish and published in 1966 by the Arabist Ambrosio Huici Miranda as *La cocina hispano-magrebí durante la época almohade: según un manuscrito anónimo del siglo XIII*.

This recipe for (traces of) almojábanas works as a small atlas of the sign(al) ecologies and the infrastructural semiotics that sustain our foodscapes today. Biosemiosis guides us towards energy-dense foods or keeps us away from an encounter with an unexpected allergen. Legal texts become overarching infrastructure to configure spaces of possibility. Signs and nudges all around us outsource our decisions and behaviours. A series of materials are presented pointing towards the architectonics produced by these codes, processes, and sign(al)s, where, like allergens in a meal, the use or presence of these semiotics shall be emphasized through a typeset that clearly distinguishes it from the rest of the list of ingredients, for example by means of the font, style, or background colour, following Regulation EU 1169/2011 on the provision of food information to consumers.

I.	SIGNALS	3
	Honey	4
	Carpanta and Neuromarketing	6
	Traces	10
II.	MIXES	13
	Convenience	15
	Flan Chino Mandarin	18
	Industrial Cold	20
	Impulses	23
	Semiotic Daze	25
III.	RECIPES	28
	From the Household Economy to Home Economics	31
	An Efficient (Because Predictable) Household	34
	Betty Crocker	39
	A Model That Performs Us	41
	The Recipe Becomes a Medium	47
	YouTube Recipes	48
IV.	DESIGNS	52
	Flavouring	52
	Bliss	56
	Extended Digestion	57
	An Architecture of Sign(al)s	57

I. SIGNALS

"That which makes a pleasant impression on the taste, and touches the sensitive part of the palate without offence"

Definition of the word *sweet*, in the Spanish Dictionary of Authorities (1726-39)¹

As a species, we share a weakness for the sweet taste. In the Iberian Peninsula, it is easy to see that by looking at the richness and variety of local sweets, the numerous recipe books that have been dedicated to them since the Middle Ages, as well curious anecdotes such as when King Philip II had to set a limit to the money the city of Alicante could spend on nougat or *turrón* in 1595.

Until cane sugar was introduced in the peninsula by the Muslims, honey was the main ingredient for sweetening food. It was used both for medicinal and culinary purposes. For a long time, honey remained the most widely used sweetener among the working classes for whom plain honey was already a dessert in itself—accessible and easy to produce. And among the most popular sweets of Al-Andalus we find the *almojábanas*, a small bun made from a mixture of water, flour, cheese and oil, which was then fried and dipped into boiling honey.

The origin of our sweet tooth is evolutionary. Our brains were wired over the course of millions of years to seek energy from our environment and the sweet taste is an indicator of high calories which can then be stored over longer periods in the form of fat, increasing the likelihood of survival in times of food shortages. Honey is one of the most energy-dense foods available and we know that chimpanzees, bonobos, orangutang and gorillas also eat it, so it would not be surprising if our common ancestors also did.

Just as a sweet taste indicates high calories, a bitter one denotes toxicity, warning the body. We could even describe tastes as assemblages of signals present in the environment orienting bodies, decisions and actions. They are part of a biosemiosis, a set of signals, communicative processes, and pre-linguistic codes that weave life. There is a short fragment in philosophers' Gilles Deleuze and Claire Parnet's *Dialogues* (1977) where the philosopher Spinoza and the biologist Jakob Von Uexkull come together to explain the relationship between body, affect, and signal which lies at the basis of this weaving.

¹ This was the first dictionary published by the Real Academia Española de la Lengua, that is the official body established in 1713 and adopted by the Kingdom the following year to fix and regulate the use of the Spanish language. The complete title of the dictionary was "Dictionary of the Castilian language, in which the true meaning of words, their nature and quality are explained, with phrases or ways of speaking, proverbs or sayings, and other things appropriate to the use of the language."

Spinoza famously claimed that the human being cannot be an empire within an empire —*imperium in imperio*— that is, we cannot avoid entering in contact with the world, nor the touch of the environment we inhabit, just as we cannot avoid affecting it in return. Inherent to this touch, the signal is what provokes an affect, that is, a variation in a given body's agency. A signal, then, is something as simple as the movement of a spider's web or a sweet taste on a hominid's tongue— “just a few signs like stars in a vast black night,” say Deleuze and Parnet. And like stars, they become an orienting device in the environment, articulating a material relation with a world we cannot dominate, nor run away from. A world where we are always, essentially, out in the open (*a la intemperie*), vulnerable and/or accessible to this semiotic exchange. I acknowledge in these signals/signs a clear architectural dimension because they construct a spatiality that is unique to any given body, what Von Uexkull defined as *Umwelt*, a surrounding world associated to the body, defined by those affects threading flesh and environment and defining our mutual agencies².

Honey

Like with any other animal, for the first human hunters and gatherers, foraging, game and harvesting depended on a dispositional interpretation of their environment, attending not only to actual forces but also potentialities and opportunities. Disposition, or “the unfolding relationship between potentials,” as defined by Keller Easterling, leads us to consider the signal ecologies threading the environment as a means to look upon spatial agencies and relations that inform the actual by working with virtualities.

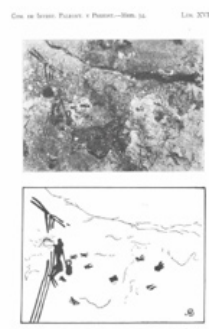
Those prehistoric hominids read and exchanged signals with the environment to articulate their encounter with the world. The interpretation of these signals, often not even consciously, drew around them fields of potentialities, risks and opportunities to orient themselves and organize spatial strategies. In the Bicorp Caves or Cuevas de la Araña (Spider Caves), in Valencia, we find the oldest representation (between 9000 and 1400 BC) of the affinity of our species with the honey of the almojábanas and the spatial strategies born out of it. The caves were discovered in 1920 by Jaime Poch y Garí, correspondent of the Palaeontological and Prehistoric Research Commission of the Spanish Museum of Natural Sciences, who gave an official note of the discovery, stating: “The exact location of the paintings is determined by the following itinerary: to find The Rebolla ravine, which is quite far to the northwest of Bicorp, first follow the road that goes to the Caroché mountain range and peak, as far as the Cazuma river, an hour from the village; then follow the road that goes to the right of the river, taking it to where the Rebolla ravine meets with the Cazuma ravine; follow the first ravine, to the left of the path that brought you up here, and in about half an hour you reach the stream, next to which

² As always when departing from Spinoza, the body must be acknowledged as more-than-human and both individual and plural. Accordingly, we could also spatially conceive and work with the surrounding world(s) associated to animal or sociotechnical multitudes.

there is a very beautiful cave; going further up the ravine, you reach the caves of La Araña, which is where the cave paintings are to be found.”

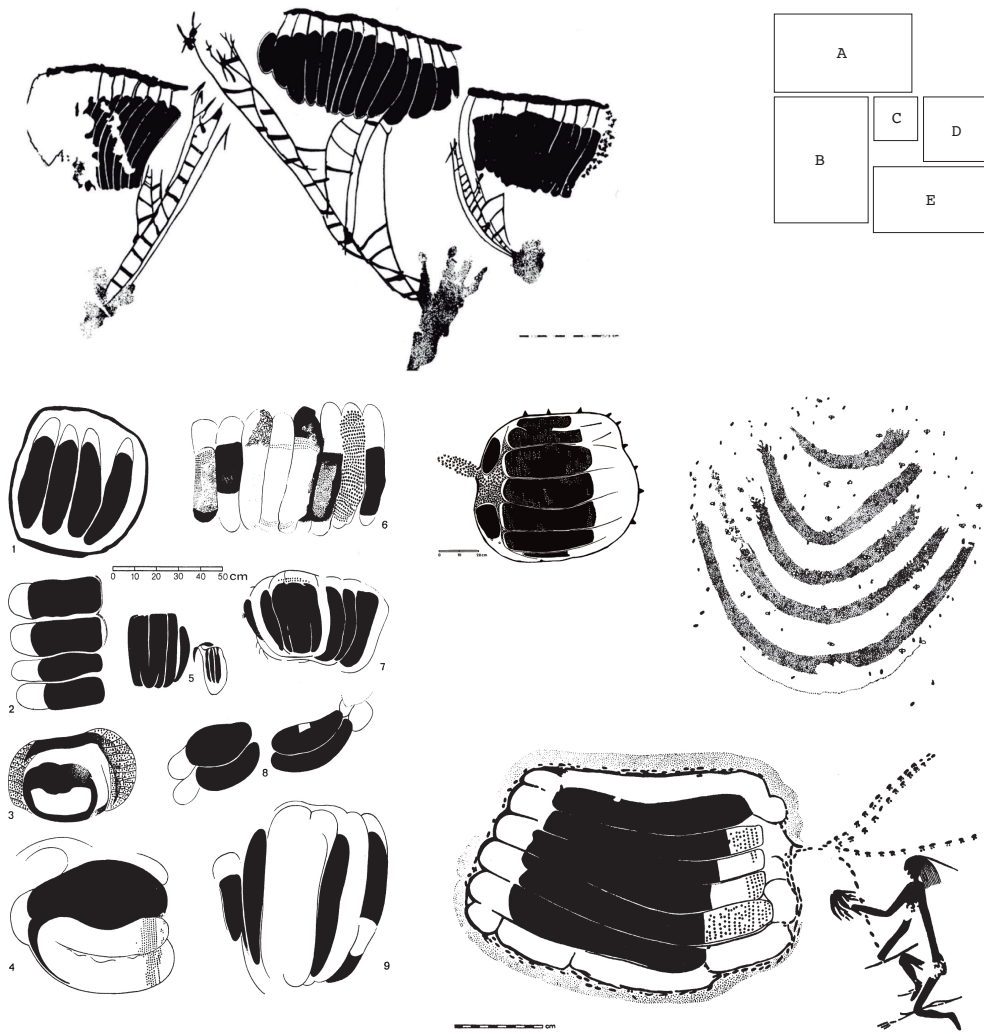
In 1924, the geologist and archaeologist Eduardo Hernández Pacheco published a detailed study describing the series of caves where the paintings are found. In the cave dubbed as “Second Cave,” in addition to hunting scenes, and animal and human figures, there is a honey harvesting scene. It depicts the way in which honey was collected in the Mediterranean ravines until well into the twentieth century, where bees nested in the cracks in the stone of the high gorges and peasants used ladders and ropes to reach them³.

The painting shows a series of long ropes held aloft by what may be branches, with some lines that may picture the crossbeams of a ladder. There are two human figures, one at the top, possibly a woman, with one hand holding a container with a handle. The other hand is in the bee colony, which has been depicted taking advantage of a hole in the wall. Numerous bees flutter around her, drawn to a larger scale and in great detail. Below, a second human figure climbs up the ladder carrying another container on his back like the one in the figure above.



01. Several pages from Eduardo Hernández-Pacheco's *Las pinturas prehistóricas de las Cuevas de la Araña (Valencia): Evolución del arte rupestre de España* (The prehistoric paintings of the Cuevas de la Araña (Valencia): Evolution of cave art in Spain), Madrid, 1924. Museo Nacional de Ciencias Naturales, Spain.

³ There is a resonance here with the words of Cervantes's *Don Quixote*: “In the fissures of rocks and the hollows of trees diligent and clever bees established their colonies, freely offering to any hand the fertile harvest of their sweet labor.”



02. (A) Scales and various hives at Anchor Shelter, South Africa (B) Various hive-like formations in caves in Zimbabwe (C) Wild hive and bees entering Zombepata Cave, Zimbabwe (D) Catenary-shaped colony surrounded by bees at Elands Bay Cave in South Africa (E) Human figure smoking a colony of bees, Toghwana Dam, Zimbabwe. Images from Eva Crane's "The rock art of honey hunters", 2005, and H. Pager's "Rock Paintings in Southern Africa Showing Bees and Honey Hunting", 1973.

Carpanta and Neuromarketing

Another evolutionary trait: when we are hungry, our sense of smell is heightened. The explanation is simple: this perceptual intensification increases our chances of finding food. As in many other layers of our relationship with the environment, we are not necessarily aware of this—it just happens. However, in Spain, those of us over forty learned from an early age how smell had the capacity of moving the body thanks to the cartoons of Carpanta. This character, a child of Spanish post-war hunger, was created by the cartoonist José Escobar in 1947 for the magazine Pulgarcito.

In many of his cartoons, we find poor Carpanta drawn by white waves that represent the smell of food. The smell creates a shared space: it literally envelops Carpanta, directs him and sets him in motion. Today there are many commercial establishments that use a similar strategy. The case of

the Cinnabon bakery chain in the United States is revealing. Cinnabon Inc. (USA, 1985, private company) modified the design of its premises so that the ovens would be close to the door and the aromas would drift outside. They also gave a higher priority to premises inside shopping centres or transit stations, and, if possible, close to staircases that would allow the smell to spread to other floors. Another bakery chain, Panera Bread (USA, 1987, private company), changed its baking hours from night to day in order to make the most of the smell of freshly baked bread.



03. Carpanta cover (“Invite me over for roast chops or I’ll sue you for polluting the atmosphere!”), drawn by José Escobar, in the Olé Collection, no. 30, 1971, published by Editorial Bruquera. Collection of the author.



04. Carpanta strip ("I smell roast chicken! I'm going to get up at once. / My nose indicates that the chicken's position is to the left!"), drawn by José Escobar, and published in the magazine Pulgarcito (Magazine for young people), no. 1377, 1958. Collection of the author.

Today, many shops, large and small, resort to artificial scents to draw customers just like Carpanta was drawn to food. Several exchanges with a series of olfactory marketing companies operating in Spain reveals a wide range of scents: freshly baked bread, cinnamon rolls, coffee, croissant, apple pie, carrot cake, chocolate cake, waffles, toast, and biscuits among others. With a simple, discreet device, and scent cartridges at €60 per month we can design the responses of a human brain that took millions of years to adapt to a world largely characterized by the difficulty of acquiring food, but which now salivates at the smell of a freshly baked “bun” which does not necessarily have anything to do with the one in front of you.

Olfactory signals reshape our surrounding worlds. They are fleeting signals whose encounters are capable of drawing complex affective images, awakening our sexual desire or our digestive system, triggering our brain's reward system or making present that which is not present—from Proust to Mercadona's Tiernos Recuerdos soap (Spain, 1960, private company). Scents are made from tiny molecules that reach our nose, stimulating a specific set among the few millions of olfactory sensory neurons present in our nose. Not all these cells are equal, they are specialized in around five hundred subsets of smells. These olfactory neurons then send a coded message to the olfactory bulb in our brain which is physically close to our amygdala and the hippocampus, responsible for the processing of emotions and memory, which might explain the vividness of those links.

The history of perfumes and essential oils is a long one. We can imagine the rich olfactory landscape of the Andalusian cities' markets and souks where these sweets were sold, how the smell of fried foods, cinnamon, or warm honey, would attract customers. However, the acknowledgement and use of this power by the marketing field is quite recent. Mark Peltier, a US Air Force technician, marketed the first scent diffusing devices to Las Vegas casinos to drown out the smell of tobacco. It was 1991 and they were large metal tubes built into the ventilation systems which diffused the smell throughout the rooms. The first casino he spoke to was the Mirage. Owned by MGM Resorts International (USA, 2000, NYSE: MGM: 44,38 USD +1,36 [3,16 %] ↑), they used a scent called “Tropical Coco Mango,” a blend of orange, pineapple, tropical jasmine, coconut and musk, in an attempt to evoke echoes of its Polynesian décor. Its use gradually spread to hotels and other businesses. In 1990,

the first scientific study on the subject was published, indicating that scenting a shop could encourage consumption.

Scent marketing is part of neuromarketing, an expanding field that applies neuroscience to study how the brain responds in consumer contexts, trying, for example, to understand which processes make people buy one thing and not another according to visual, acoustic, haptic or olfactory stimuli, therefore, according to signal ecologies. Applied neuromarketing is used to design retail environments, playing with environmental signals and shaping consumers' associated worlds and their affections to orient them towards certain ends. Thus, brands such as BMW (Germany, 1916, 100.12 EUR +0.37 [0.37 %] ↑) or Porsche (Germany, 1931, ETR: PAH3 / 55.94 EUR +0.34 [0.61 %] ↑) have specialized laboratories to manipulate sound either to make the driver believe that the engine is more powerful than it is, or “to make sure that a Porsche sounds like a Porsche.” The aim is not to generate a simulacrum, but to ensure that as the car becomes quieter on the outside, the driver can feel “the wondrous sound of the Porsche drivetrain to the interior with clarity and verve.” To do this, they use what they call a “sound symposer,” not a loudspeaker but a mechanical path for the sound to travel through the car: “A line for tones consisting of a plastic hose with a gas-impermeable membrane. That’s how it transports the passionate trumpeting of the intake pipe, for example, into the cockpit.”

Within neuromarketing, we find stimuli designed to act as “nudges,” a term defined by Richard Thaler and Cass Sunstein in 2008 as a “gentle poke” inscribed in the environment capable of provoking a specific behaviour. Nudges are environmental signals which touch upon our bodies to direct them. They can take many forms, from a sticker of a fly on airport urinals to improve the aim of users, to reminder letters to increase tax compliance, or arranging children's toys at the end of an IKEA (Sweden, 1943, private company), synchronized with the increased exhaustion of its younger visitors.

Thaler and Sunstein highlight that the nudge should not enforce a behaviour nor eliminate other possibilities of action. Nudging plays with unconscious mechanisms to make options or potential encounters less visible—that is, it designs our surrounding world from a dispositional point of view. There's little doubt we would all be in favour of using a fake fly to make the work of the cleaning staff easier, but are the vibrations made by bracelets patented in 2018 by Amazon to orient the hands of workers towards the package they are looking for also “gentle pokes”?

The question of control is inherent to nudging, neuromarketing and the whole field of behavioural insights. Nudges play a key role in “environmentality”, a new form of governmentality that works through ubiquitous, distributed, adaptive and semiautonomous networks of sensors and actuators. It brings forth what Beth Coleman has termed a technology of the surround whose nudging, and therefore haptic dimension, becomes instrumental in the design of regulated fields of possibility around us, informing us through different modes of pressure. The presence of a camera or a

microphone, the vibration of a smartphone or the alertness of a virtual assistant are just the most basic elements of an algorithmic touch manifold which has become a key agent in the production of space. Each sensor captures information, and through that capture, it already modifies its surrounding environment, but they are also, through their networked processing and by means of actuators and effectors, distributed agents performing an action within that same environment, responding to the captured information and re-modelling, *informing* the situation as well as actions, behaviours, emotions, or ideas.

Immersed in these networked environments, our capacity for action in space, our architectural agency, becomes defined through these signal ecologies. Consequently, in order to study the architectonics at play within this new form of governmentality, it is important to understand an entire series of infrastructural semiotics that support, regulate and modulate the associated world of our bodies and how these systems of signs and codes, from languages to protocols, algorithms, or biosemiotics, (un)gently poke, affect and arrange our world and autonomy.

Traces

To unfold the architectonics of these signal ecologies, we can follow the traces of this environmental touch. The philosopher Spinoza defined “traces” or *vestigium* as the point of contact or encounter between two bodies. When a body collides with another, the latter “changes its surface and, as it were, impresses on (it) certain traces (*vestigium*) of the external body striking against (it)”. From there, philosopher Lorenzo Vinciguerra has used the proximity between *sema*, the sign, and *soma*, the body, to delve into the possibility of a “somatic semiotics” with the idea that no one and nothing can avoid being affected by the world at its origin. Or as interdisciplinary researcher María Puig de la Bellacasa points out, this mutual implication, where the change of one transforms the other, and vice versa, is intensified when we acknowledge this contact as a form of touch. There is no untouchable body: modal existence implies dwelling in touch and, therefore, in a common trace that always involves a plurality. This leads us to understand the environment as an interweaving of surrounding worlds, where traces appear as indices of their constituent encounters and a tool for analysing their architectonics—that is, as maps of the affective images they produce on the bodies, guiding them.

Contact with the environment is also the origin of the “traces” that we find on the labels of our food products. These traces refer to minute ingredient quantities that may have found their way into the product unintentionally as a result of foodstuffs living together in the same environment. As soon as there is a shared atmosphere or environment, there may be contamination—an encounter, a trace—between foods.

If a factory produces chocolate with nuts on one side of its machinery and dairy products on the other side, but all of them are in the same space, cross-contamination is possible, either through the use of shared machines or even simply through the air, causing the chocolate to contain lactose or the milk to contain nuts, both allergens that by law must be indicated on the product's labelling. Assemblages of signals, labels as collections of signs, to alert of the presence of an invisible but active trace: Article 21, Labelling of certain substances or products causing allergies or intolerances, of Regulation EU 1169/2011 on the provision of food information to consumers: (a) they shall be indicated in the list of ingredients in accordance with the rules laid down in Article 18(1), with a clear reference to the name of the substance or product as listed in Annex II; and (b) the name of the substance or product as listed in Annex II shall be emphasised through a typeset that clearly distinguishes it from the rest of the list of ingredients, for example by means of the font, style or background colour. Legal texts like this one demand our architectural attention, as they become a decisive instrument in the determination and design of signs within the environment.

Food traces are essential to ensure safety, as are those physical trails left by distinctive industrial processes that laws, codes, and protocols mainly address. These texts in turn are an essential part of infrastructural semiotics. Thus, we need to look into the connected institutions producing the scientific knowledge around these traces which in turn shape the legal frameworks that inform our everyday. Among these institutions, there is the European Food Security Agency (EFSA) which provides independent scientific advice about risks related to food at a European level. Headquartered in Parma, Italy, it welcomes, behind the non-signifying glass façade of its office building, experts from all around the continent and scientific fields. Its Spanish correspondent is the Agencia Española de Seguridad Alimentaria y Nutrición (AESAN) which since its foundation in 2001, is responsible for managing risks to ensure the safety of the Spanish food chain as well as promoting the quality of Spanish citizens' nutrition.

The offices of AESAN can be found at the Calle Alcalá 56 in the centre of Madrid, in a 1946-building designed by the architects Javier Barroso and Enrique García Ormaechea. The sobriety and elegance of its wood-panelled interiors speak of a bureaucratic abstraction that shrouds the relevance of the agency's analysing, evaluating, and risk-managing within the food chain. Its work is complemented by the laboratories at the Centro Nacional de Alimentación (National Food Center). The CNA was created in 1974 and since 2004 it acts as the reference lab in Spain, analysing food (from regular EU marketed foodstuff to those linked to health alerts). The CNA also coordinates a network formed by all laboratories, both private and public, which have analysis and risk management roles regarding these issues around the country. These labs and offices—whose inhabitants are surprised by our interest—complement each other through what are often noiseless but crucial measures, determining—designing— through words and numbers the fields of possibility of our foodscapes.

ANNEX II

SUBSTANCES OR PRODUCTS CAUSING ALLERGIES OR INTOLERANCES

1. Cereals containing gluten, namely: wheat, rye, barley, oats, spelt, kamut or their hybridised strains, and products thereof, except:
 - (a) wheat based glucose syrups including dextrose ⁽¹⁾;
 - (b) wheat based maltodextrins ⁽¹⁾;
 - (c) glucose syrups based on barley;
 - (d) cereals used for making alcoholic distillates including ethyl alcohol of agricultural origin;
2. Crustaceans and products thereof;
3. Eggs and products thereof;
4. Fish and products thereof, except:
 - (a) fish gelatine used as carrier for vitamin or carotenoid preparations;
 - (b) fish gelatine or Isinglass used as fining agent in beer and wine;
5. Peanuts and products thereof;
6. Soybeans and products thereof, except:
 - (a) fully refined soybean oil and fat ⁽¹⁾;
 - (b) natural mixed tocopherols (E306), natural D-alpha tocopherol, natural D-alpha tocopherol acetate, and natural D-alpha tocopherol succinate from soybean sources;
 - (c) vegetable oils derived phytosterols and phytosterol esters from soybean sources;
 - (d) plant stanol ester produced from vegetable oil sterols from soybean sources;
7. Milk and products thereof (including lactose), except:
 - (a) whey used for making alcoholic distillates including ethyl alcohol of agricultural origin;
 - (b) lactitol;
8. Nuts, namely: almonds (*Amygdalus communis* L.), hazelnuts (*Corylus avellana*), walnuts (*Juglans regia*), cashews (*Anacardium occidentale*), pecan nuts (*Carya illinoensis* (Wangenh.) K. Koch), Brazil nuts (*Bertholletia excelsa*), pistachio nuts (*Pistacia vera*), macadamia or Queensland nuts (*Macadamia ternifolia*), and products thereof, except for nuts used for making alcoholic distillates including ethyl alcohol of agricultural origin;
9. Celery and products thereof;
10. Mustard and products thereof;
11. Sesame seeds and products thereof;
12. Sulphur dioxide and sulphites at concentrations of more than 10 mg/kg or 10 mg/litre in terms of the total SO₂ which are to be calculated for products as proposed ready for consumption or as reconstituted according to the instructions of the manufacturers;
13. Lupin and products thereof;
14. Molluscs and products thereof.

⁽¹⁾ And the products thereof, in so far as the process that they have undergone is not likely to increase the level of allergenicity assessed by the Authority for the relevant product from which they originated.

05. Annex II, SUBSTANCES OR PRODUCTS CAUSING ALLERGIES OR INTOLERANCES, from the Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers, amending Regulations (EC) No 1924/2006 and (EC) No 1925/2006 of the European Parliament and of the Council, and repealing Commission Directive 87/250/EEC, Council Directive 90/496/EEC, Commission Directive 1999/10/EC, Directive 2000/13/EC of the European Parliament and of the Council, Commission Directives 2002/67/EC and 2008/5/EC and Commission Regulation (EC) No 608/2004

II. MIXES

A quick internet search points to several brands offering processed almojábanas that can be purchased in Spain, Colombia, and other American countries. Liderpan's "frozen pre-cooked almojábanas" (Colombia, 1984, private company) come in packs of 5 or 9 almojábanas ready to "heat and enjoy." Colmaíz, a subsidiary of Ingredion (US, 99.07 USD +0.30 [0.30 %] ↑), offers 1-kilogram packs of a powdered blend of modified starches to prepare "the most exquisite and authentic almojábanas from the Cundiboyacense highlands". To bake them, Peasant cheese—a Colombian kind of fresh cheese—, egg, and water must be added. Maga Foods (Puerto Rico, 1999, private company) has also marketed a powdered mix to which milk, butter, and eggs were added in order to make it "ready to fry."

FICHA TÉCNICA PRODUCTOS LIDERPAN S.A.S		CÓDIGO: FTP-045 VERSION: 05 FECHA: 20-01-23																																																									
NOMBRE DEL PRODUCTO	Denominación Legal del Producto ALMOJABANA, ALMOJABANAS, ALMOJABANITA, ALMOJABONITAS, ALMOJABANA PRECOCIDA CONGELADA																																																										
MARCAS COMERCIALES	SANIN, TRIGOSOL, SANIN ARTESANAL, VIDASOL, BIZCOTTY, CARIBE, SURTIFAMILIAR, BELALCAZAR, TOSTAO, MAS DELI, +MAS, FRESCAMPO, MERCA 2, LA GRAN COLOMBIA, DOÑA LUPE, DON PRECIO, MERCA PAVA, EL RENDIDOR, HORNEADITOS, SUPER INTER.																																																										
DESCRIPCIÓN	Producto alimenticio obtenido a partir de la mezcla de cereales, queso, leche y azúcares.																																																										
NOTIFICACIÓN SANITARIA	Resolución del InVima No. 2019019855 del 23 de mayo de 2019, por la cual se concede la notificación sanitaria NSA-0006837-2019 por el término de 10 años.																																																										
INGREDIENTES	Composición Cualitativa Detallada Ingredientes en orden decreciente: Queso Cuajada (Leche entera, Sal, Estabilizante (Cloruro de calcio), Cuajo), Harina de Trigo Fortificada (Cereal que contiene Gluten) con Niacina (25 mg/kg), Hierro (44 mg/kg), Vitamina B1 (6 mg/kg), Vitamina B2 (4 mg/kg) y Ácido Fólico (1.54 mg/kg), Azúcar, Fecula de Maíz, Leche en Polvo, Almidón de Yuca																																																										
ALÉRGENOS	Este producto contiene Leche, Derivados Lácteos y Gluten y se elabora en una planta donde se procesan productos con Gluten, Sulfitos, Tartrazina, Huevo, Chocolate, Leche, Mantequilla, Queso.																																																										
MERCADO OBJETIVO	Producto alimenticio de consumo directo fabricado para todo tipo de consumidores																																																										
CARACTERÍSTICAS ORGANOLEPTICAS	Características	Método	Resultado																																																								
	Color	Visual	Café claro																																																								
	Textura	Sensorial	Suave																																																								
	Olor	Sensorial	Característico a queso																																																								
	Sabor	Sensorial	Suave a queso																																																								
CARACTERÍSTICAS MICROBIOLÓGICAS - RESOLUCION 1407 DE 2022																																																											
PARÁMETRO	n	c	m	M																																																							
Mohos	5	2	100 ufc/g	200 ufc/g																																																							
Escherichia Coli	5	0	< 10	—																																																							
Staphylococcus coagulasa positivo	5	0	< 100	—																																																							
Salmonella spp	5	0	Ausencia/25g	—																																																							
Listeria monocytogenes	5	0	Ausencia/25g	—																																																							
CONDICIONES DE ALMACENAMIENTO	*Almacenar sobre estibas, canastillas o estanterías, nunca directamente sobre el suelo. *No se debe almacenar o transportar con sustancias químicas. *Almacenar y transportar el producto en condiciones que permitan conservar su congelación hasta el momento previo a su consumo (-18°C a -24°C). *Almacenar en un ambiente limpio y seco, alejado de agentes o productos que puedan generar contaminación cruzada y/o cambios organolépticos del producto.																																																										
VIDA ÚTIL	8 meses (240 días) en condición de congelación. Nota: Contados a partir de la fecha de fabricación																																																										
INFORMACION NUTRICIONAL	<table border="1"> <thead> <tr> <th colspan="4">INFORMACIÓN NUTRICIONAL</th> </tr> <tr> <td colspan="4">Tamaño de porción: 1 unidad (45 g)</td> </tr> <tr> <td colspan="4">Número de porciones por envase: 5</td> </tr> <tr> <th colspan="2">VALORES MEDIOS</th> <th>por 100g</th> <th>por porción</th> </tr> </thead> <tbody> <tr> <td colspan="2">VALOR ENERGÉTICO/ENERGÍA</td> <td>1246 kJ/298 kcal</td> <td>652 kJ/154 kcal</td> </tr> <tr> <td colspan="2">GRASAS/LÍPIDOS</td> <td>16 g</td> <td>9 g</td> </tr> <tr> <td colspan="2">de las cuales:</td> <td></td> <td></td> </tr> <tr> <td colspan="2">- Saturadas</td> <td>13 g</td> <td>8 g</td> </tr> <tr> <td colspan="2">HIDRATOS DE CARBONO</td> <td>19 g</td> <td>8,5 g</td> </tr> <tr> <td colspan="2">de los cuales:</td> <td></td> <td></td> </tr> <tr> <td colspan="2">- Azúcares</td> <td>9,9 g</td> <td>4,5 g</td> </tr> <tr> <td colspan="2">FIBRA ALIMENTARIA/FIBRA</td> <td>0 g</td> <td>0 g</td> </tr> <tr> <td colspan="2">PROTEÍNAS</td> <td>21 g</td> <td>9,8 g</td> </tr> <tr> <td colspan="2">SAL</td> <td>1 g</td> <td>0,5 g</td> </tr> </tbody> </table>			INFORMACIÓN NUTRICIONAL				Tamaño de porción: 1 unidad (45 g)				Número de porciones por envase: 5				VALORES MEDIOS		por 100g	por porción	VALOR ENERGÉTICO/ENERGÍA		1246 kJ/298 kcal	652 kJ/154 kcal	GRASAS/LÍPIDOS		16 g	9 g	de las cuales:				- Saturadas		13 g	8 g	HIDRATOS DE CARBONO		19 g	8,5 g	de los cuales:				- Azúcares		9,9 g	4,5 g	FIBRA ALIMENTARIA/FIBRA		0 g	0 g	PROTEÍNAS		21 g	9,8 g	SAL		1 g	0,5 g
INFORMACIÓN NUTRICIONAL																																																											
Tamaño de porción: 1 unidad (45 g)																																																											
Número de porciones por envase: 5																																																											
VALORES MEDIOS		por 100g	por porción																																																								
VALOR ENERGÉTICO/ENERGÍA		1246 kJ/298 kcal	652 kJ/154 kcal																																																								
GRASAS/LÍPIDOS		16 g	9 g																																																								
de las cuales:																																																											
- Saturadas		13 g	8 g																																																								
HIDRATOS DE CARBONO		19 g	8,5 g																																																								
de los cuales:																																																											
- Azúcares		9,9 g	4,5 g																																																								
FIBRA ALIMENTARIA/FIBRA		0 g	0 g																																																								
PROTEÍNAS		21 g	9,8 g																																																								
SAL		1 g	0,5 g																																																								
INSTRUCCIONES DE USO Y CONSUMO	Preparación: *Air Fryer: Descongele el producto hasta alcanzar la temperatura ambiente y posteriormente introduzca el producto al Air Fryer a 200 °C por 5 minutos. *Tostador: Descongele el producto hasta alcanzar la temperatura ambiente, posteriormente introduzca el producto al tostador a 375 °C por 5 minutos. *Sarten: Descongele el producto hasta alcanzar la temperatura ambiente, posteriormente coloque el producto a fuego lento en un sartén, tápelo, esté atento a su coloración y de vuelta de forma continua para garantizar su calentamiento correcto. *Después de su cocción, el producto debe consumirse en el menor tiempo posible. Nota: Una vez descongelado, no volver a congelar el producto.																																																										
PRESENTACIÓN COMERCIAL																																																											
PRESENTACIÓN		EMPAQUE PRIMARIO / CÓDIGO DE BARRAS ASIGNADO	EMBALAJE																																																								
Caja de 200 unidades, peso neto 10000 g/ 352.7 oz empacadas en 4 bolsas de 50 unidades		BOLSA DE POLIETILENO	Caja de cartón corrugado calibre 730 Dimensiones (17.12 X 14.4 X 10.6 pulgadas)																																																								
Caja de 100 unidades, peso neto 4500 g/ 158.7 oz empacadas en 2 bolsas de 50 unidades		BOLSA DE POLIETILENO	Caja de cartón corrugado calibre 730 Dimensiones (14.6X11.0 X 7.7 pulgadas)																																																								
Bolsa con 5 unidades, peso neto 225 g / 7.9 oz		Bolsa plana, Matte: PET/LDPE 72 micras Código de barras (7707211972210)	Caja de cartón corrugado calibre 730 Dimensiones (14.6X11.0 X 7.7 pulgadas)																																																								
DATOS DEL FABRICANTE	LIDERPAN S.A.S Carrera 12 No. 14A-140 Yumbo -Valle Colombia Pagina web: www.productossanin.com ventas@productossanin.com - calidad@productossanin.com																																																										

06. LIDERPAN S.A. Sanin's product data sheet for ALMOJABANA, ALMOJABANAS, ALMOJABANITA, ALMOJABONITAS, PRECOOKED FROZEN ALMOJABANA

The origin of the baking mix, like those of Colmaiz's or Maga Foods to make almojábanas, can be found in the United States. In 1930, John D. Duff filed a patent on behalf of his company P. Duff and Sons, Inc. (United States, founding date unknown, private company) for a "Process for the production of a mixture of dehydrated flour." His invention was born out of the need to dispose of the company's surplus molasses, which was often lost before it could be marketed. However, it also made it possible to distribute cheaper foodstuffs with a longer shelf life to places that otherwise would not have had access to them during the Great Depression. The patent points out how "in the daily preparation of bakery products, many different ingredients are used, which requires keeping a complete stock of materials on hand. This is not only expensive and cumbersome, but requires careful measuring and mixing, and therefore the availability of suitable equipment. In addition, it too often leads to unsatisfactory results or failures that represent a serious waste of time, money, materials and energy." The convenience of the consumer was brought to the fore, highlighting the importance of neutralizing uncertainty. The patent, a form of infrastructural language per se, was applied with the example of a gingerbread mix comprising wheat flour, molasses, sugar, butter (or vegetable fat), salt, baking soda, whole egg powder, ginger, and cinnamon.

Patented Oct. 24, 1933

1,931,892

UNITED STATES PATENT OFFICE

1,931,892

PROCESS OF MAKING A DEHYDRATED FLOUR MIXTURE

John D. Duff, Pittsburgh, and Louis E. Dietrich, Crafton, Pa., assignors to P. Duff & Sons, Inc., a corporation of Pennsylvania

No Drawing. Application December 19, 1929. Serial No. 521,468

5 Claims (Cl. 99-19)

This invention relates to a dehydrated flour for use in making pastry products and to a process of making the same.

In the ordinary preparation of pastry products there is a large and varied number of ingredients which must be used which means keeping a complete stock of materials on hand. This is not only expensive and inconvenient, but sometimes careful measurements and mixing and, therefore, the provision of suitable apparatus therefor. In addition to the above, unsatisfactory results or failures occur too frequently which represent a serious loss of time, of money, of materials and of energy.

One of the objects of the present invention is to achieve the making of pastry products in an extremely simple and economical manner without the possibility of unsatisfactory results or failures.

Another object is to provide an article of commerce containing all the dehydrated ingredients in a dry form and from which consequently the pastry product can be made merely by moistening and cooking.

A further object is to provide a dehydrated flour mixture which requires the addition of nothing but water and heat to convert it into a pastry product, thereby eliminating the maintenance of a stock of materials and apparatus together with the elimination of uncertainty of result.

Other and further objects will be understood by those skilled in this art or will be pointed out hereinafter.

We, therefore, form our mixture from the ingredients required for the manufacture of a dehydrated flour which contains those elements which will in a particular instance, make the desired product when water in any form, as milk, and the fat is added thereto, and the whole baked or otherwise suitably cooked.

As a particular example, we have invented a dehydrated flour for making ginger bread and we will use this mixture as an illustration of our product and process. In a typical instance, we make use of the following ingredients:

	Pounds	Ferment
Wheat flour	100	0.0
Molasses	11	0.2
Butter	11	0.2
Salt	1	0.1
Baking soda	1	0.1
Whole egg powder	1	0.1
Ginger	1	0.1
Cinnamon	1	0.1

The amounts of these ingredients are not to be considered as restricted solely to the above percentages as any or all of them can be varied within a fairly wide limit so that the formula must be considered as giving merely the idea involved rather than any limitation as to the exact ingredients or their amounts.

The above ingredients are preferably mixed in a manner which we shall describe and wherein the molasses, shortening, sugar and salt are put in the bowl of a dough mixing machine wherein they are constantly agitated while heat is simultaneously applied thereto, the application of the heat being made in any convenient way such as by the insertion of a steam coil into the bowl of the mixing machine. The temperature of the mixture is allowed to rise until the shortening is thoroughly melted. It is to be understood that agitation has been taking place all during this time and that the sugar and salt have dissolved into the molasses. The melted fat and the solution of sugar and salt in molasses form an emulsion which is made very uniform by the agitation and consequently a very homogeneous mixture of the materials so far added is obtained.

When such a condition has been reached the heating is then discontinued and the flour added to the above named homogeneous mixture while the kneading appliance is in operation. The flour can be added gradually and it is preferable so added and when completely added a dough is formed which contains the first five ingredients of the above formula.

The next step is to dry the dough. This may be done in a variety of ways. We may roll the dough into a thin sheet which is dried by subjecting it to the influence of a blast of warm air, or we may divide the dough mechanically into small lumps which may be placed on trays or other suitable heated drying cabinet. We may also force the dough through steel dies to form thin strands or ribbons, like spaghetti, and these strands or ribbons may be divided in a suitable apparatus.

However the dough is dried, it is next ground to a powder and this may be done in a variety of ways of grinding mill, the important requisite being that it be reduced to a suitable state of fineness and we have found that a state of fineness such that it will pass through a twenty-mesh sieve is satisfactory.

This powder having been formed, the manufacture of the flour mixture is practically complete as all that is then required is to simply mix in the remaining ingredients thoroughly which are

...how
DUFF'S
Ginger Bread
MIX

ADD WATER - MIX - BAKE!
That's all!

Saved the day!

It might have been one of those dark days in your life—one that left you breathless and miserable from rushing and fussing. But it wasn't. True, the parent-teachers' committee kept you unexpectedly late on an afternoon when you knew the children were bringing guests home for dinner. But you never lost your poise for an instant. You served a "company" dinner simply by adding Duff's, golden ginger bread to a simple menu. Home-made ginger bread, of course—made fresh for dinner between changing your dress and arranging the dining room table. Naturally you used Duff's Ginger Bread Mix. That's what made it all so easy. Just add water . . . stir . . . and bake.

DUFF'S Ginger Bread MIX
P. DUFF & SONS, INC., PITTSBURGH, PA.

Duff's
GINGER BREAD
MIX

ADD WATER - MIX - BAKE - THAT'S ALL!

with **MOLASSES WHIPPED CREAM**

Make gingerbread with **DUFF'S MIX**, according to directions on box.

Cut into golden-brown squares and serve with a heaping spoonful of Molasses Whipped Cream. To make Molasses Whipped Cream: whip 1/2 cup heavy cream very stiff. Then fold in 2 tbs. molasses. It's nutritious and delicious!

P. S. When you buy molasses, be sure to ask for Duff's Light Molasses.

07 Patent "PROCESS OF MAKING ALPHA DEHYDRATED FLOUR MIXTURE". Developed by John D Duff and Louis E Dietrich, and registered by Duff & Sons Inc. with the US Patent and Trademark Office in 1930. <https://patents.google.com/patent/US1931892A/en>. 1940s advertisements for Duff's Ginger Bread Mix.

Although Duff's gingerbread mixes were a success, in 1933 he filed a new patent with a change that would be adopted by other brands: the need to add fresh eggs to the mixture. The text points out how "dried or powdered eggs, which, although wholly satisfactory in many

respects, are considered by some to be inferior material.” The powdered egg was a psychological deterrent to “the housewife and the buying public (who) generally seem to prefer fresh eggs.” For a long time, both models were present in the market and thriving, with a 1950s survey showing that while people said they preferred to add the eggs they were more prone to buy the mixes that did not require them. In that same decade though, General Mills, one of the biggest marketers of baking mixes, saw its sales flatten out. They hired industrial psychologist Ernest Dichter to understand the reason behind this. Dichter proved that housewives demanded more involvement in the process, to feel there was a personal contribution by them in the recipe which created an added value for them. However, beyond the fresh eggs, the biggest transformation was decoration. As the magazine *Better Homes & Gardens* recommended in 1953, once the cake is out of the oven, “you can put your effort into glorifying [it] with frosting, dreaming up an exciting trim that puts your own label on it.”

Convenience had to balance out interpassivity. Coined by philosopher Robert Pfaller, this term describes a soft form of subjugation, articulated through pre-coded delegated participation. As these companies sought to make things easier and in order to avoid detachment, an equilibrium had to be found between the design of the processed foodstuff and the disposition of the cook.

Convenience

Industrially processed and prepared food points to a series of spatio-temporal dissociations within the food chain. They mark a shift from food to a designed product that extends far beyond foodstuff, where steps and materials are compressed to deploy them in different and detached timeframes as well as in diverse modes, either by accelerating steps, or by allowing to stretch consumption into longer periods of time. Processed and prepared food can therefore be considered as a form of energy storage that leads to alternative paths of use and transformation down the line.

There has been food processing since there has been cooking, and food processing techniques like salting, fermentation or smoking historically allowed our species to preserve food for longer periods of time, while germination was key to farming and the transformation of human settlements. However, the developments in the field of chemistry in the nineteenth century multiplied these methods. We see this for instance in Julius Maggi's instant soup, created on behalf of the Swiss government to improve the diet of the working class. Nonetheless, it would be after the Second World War that this industry reached its golden age, radically transforming the way the world ate, as shown by the list of novel foods published in 1980 by the OECD.

American supermarkets had first been bought (or produced) and processed by a food firm. Although more highly developed in the United States, the trend for food processing to dominate agriculture is clear elsewhere as well.

Technological advances and shifts in patterns of consumption, as well as the size of the processing industry and the large food firm's capacity for vertical integration and co-ordination, account for this shift of dominance. Since mass production technologies have made possible the continuous processing of homogeneous food products, firms need to secure standardised, often tailor-made raw materials. So large firms, to ensure the quantity and specifications of their supply, have increasingly invested in agriculture or, more commonly, fixed contractual relations with farmers.

Technological innovations from chemicals and pharmaceuticals, as well as engineering, are also contributing to the change in status of the links in the food chain. One of the most decisive trends is that an increasing number of basic crops produced on the farm are no longer viewed as finished or even semi-finished products, but rather valued for their components: what kinds of sugars, starches, fats and proteins they yield when broken down, or "fractionated". Using highly sophisticated chemical engineering techniques, foods' constituents can now be isolated and restructured at the molecular level to improve or change their properties.

Primary processing firms can produce purified and stabilised intermediate food products (flours, concentrates, isolates, syrups, acids, flavorings etc.) with well-defined technological and nutritional properties. Firms downstream, released from direct dependence on agricultural supply, reconstitute the often interchangeable elements into consumer products. Agriculture, rather than remaining distinct from industry, has increasingly become simply the link in the industrial food chain that provides the substrata for primary processing.

The Growth of the Industry

Although the food industry is large, it has been growing more slowly than the manufacturing sector as a whole. This is not surprising, since per capita calorie intake in OECD countries is near saturation. Still, rise in demand for processed food has been exceeding that for food in general. The OECD community's rural-to-urban migration (which means that fewer households produce their own food), the development of distribution and, especially, changes in women's roles have helped the industry grow. In fact most successful "new" products have really just been "old" ones presented in a more convenient form (frozen, "instant", pre-mixed, pre-cooked, oven-ready, ready-to-eat, bite-sized, in individual portion packets). Thus much of the actual, though unrecorded, value added of the domestic work of housewives has been transferred to the food industries.

By now, according to the OECD study, the social trends encouraging food industry growth have probably peaked as far as their effect on the industry is concerned. However, since most international trade in processed food products occurs between developed countries, the study does not predict stepped-up exports to the Third World in the foreseeable future. Instead, the large food firms may increasingly turn their attention to creating non-food items from agricultural raw materials.

Organisation of Research and Technology

The OECD report describes the structure of research and the state of knowledge of food manufacturing in Member countries, with attention to the share of these capacities held by private industry. While the overall intensity of industry financed R & D is quite low, the pattern of expenditure by firms on R & D well reflects the structural tendencies of the food industry, such as concentration and vertical and

horizontal expansion, as well as the predominant emphasis on product proliferation. Furthermore, many of the most important innovations are results of transfers of technology from other industries, especially the chemical and pharmaceutical, mechanical and electrical engineering, and packaging materials sectors.

The majority of firms do not perform their own R & D, relying for

2. SOME NEW FOOD PRODUCTS

Products introduced during 1945-1965 (1)

Vitamin-enriched breakfast cereals
Breakfast cereals with freeze-dried fruits
Instant oatmeal
Dehydrated flaked potatoes
Instant-blending flour
Frozen dinners and specialties
Dehydrated potato specialties
Synthetic orange drink concentrate
Orange juice concentrate
Boil-in-bag frozen vegetables
Liquid diet foods
Polyunsaturated (corn oil) margarines
Soft margarine
Unsalted, frozen margarine
Instant dessert & pudding mixes
Precooked rice
Packaged rice specialties
Extruded dry pet foods
Semimoist meat pet foods
Vegetable-oil coffee lighteners
Dry salad dressing mixes
Freeze-dried soluble coffee

Products introduced circa 1978 (2)

Microwave-compatible pancakes
Cough candy lollipops
Sangria-flavoured soft drink
Quarter-pound hot dog
Turkey kielbasa sausage
Pizza-flavoured sticks
Yogurt bran bread
100 % fat-free candy
Soft drink concentrate in aerosol can
Kosher bubble gum balls
Frozen yogurt bars
Spoonable cheese spread
Canned egg custard
Flavoured grits
Powdered Worcester sauce
Jalapeno pepper jelly
Honey jelly
Carbonated soft drink powder
Smoke-flavoured salt
Aseptically packaged milk
Rice bread
Fructose sweeteners
Frozen quiche
Powdered isotonic beverage mix
Powdered cocktail mix
Pre-moulded cranberry jelly

(1) Selected by R.D. Buzzell and R.E.M. Nourse in Product Innovation in Food Processing as "substantially different in form, technology, or ingredients..."

(2) Selected by the editors of Progressive Grocer as being especially "ingenious, innovative, and intriguing".

08 List of new food products introduced to the market between 1945 and 1961 (1) and around 1978 (2), from the article "THE FOOD INDUSTRY. Innovation and Industrial Structure" in *OECD Observer*, Vol 1980, No 5, published by the Organisation for Economic Co-operation and Development (OECD).

The 1950s also mark what would later become known as the Great Acceleration, the moment after which climate indicators such as CO₂ and methane levels shot up parallel to a series of socio-economic factors such as growth in population, the number of cars and the use of energy, water and other resources. Growing urbanization and the automobile accelerated movement and reduced

distances. Meanwhile, at home, the appearance of electrical appliances and pre-cooked meals or instant formulas was presented as the solution to the gradual incorporation of women into the workforce. This slow but firm shift left women with no time for reproductive tasks, whose responsibility was not only not questioned but reinforced through the new models of women advanced by the consumer society in general and the food industry in particular.

On the other side of this acceleration was the promise of a fuller life with better things to do than “mixing, blending, sorting, trimming, measuring, cooking, serving, and all the other actions that have gone into the routine of living.” At least that's what Charles Mortimer, marketing director of General Foods, today The Kraft Heinz Company (US, 1929, NASDAQ: KHC: 38,80 USD +0,41 [1,07 %] ↑), thought. Convenience, he said was “the great additive which must be designed, built in, combined, blended, interwoven, injected, inserted, or otherwise added to or incorporated in products or services if they are to satisfy today's demanding public. It is the new and controlling denominator of consumer acceptance or demand.” As Al Clausi, one of the company's star chemists and inventor of Tang juice powder recalls: “That signal went out to everybody, in marketing, in technical. That we now need to look at what we're doing and ask, ‘How can we make it more convenient?’ That was the beginning of the era of instant this, instant that, powdered this, powdered that.”

Etymologically convenience refers to that which does not cause discomfort or requires effort. Practically it demanded the production not just of food, but of a complex surround to that foodstuff that would fulfil an infrastructural function within an environment increasingly conceived as a circuit to guide the consumer, extending the logistical principles of distribution to consumer behaviour. Convenience is provided by (not necessarily edible) additives and processes that compress time, influencing the form of food (e.g. powdered, frozen), their packaging (e.g. with oven-ready trays or disposable containers), their now necessary directions (e.g. listing the steps to follow, often with drawings) or the utensils that are sold along in a profitable union.

Among these additives, chemicals would of course keep playing a key role. Clausi was one of countless chemists who joined the growing body of technicians and scientists working for the food industry after the war. Clausi and his team spent two years in the late 1940s working unsuccessfully to produce an instant pudding because General Foods made them use natural ingredients. Although artificial colourings, flavourings, and preservatives were already appearing on ingredient lists, the company was convinced that a step further would not be accepted by consumers. Everything changed when a rival company filed a patent for instant pudding using a mixture of synthetic compounds. With the approval of his superiors, Clausi soon filed a patent for Jell-O instant pudding, one of the company's most profitable brands. Its formula contained a pyrophosphate to coagulate the milk and an orthophosphate to accelerate thickening, so that a dessert that would usually take several hours could “be prepared by the housewife in 5-10 minutes.”

Flan Chino Mandarín

The Spanish version of this was called *Flan Chino Mandarín*. It was the invention of a Spanish chemist, Alfredo Valdés García, and the marketing genius of José Ferro. In Franco's Spain, during the 1950s, no international brand could enter the market. Moreover, as had happened to Duff during the Great Depression, not everyone could easily obtain fresh eggs or sugar even a decade after the end of the Civil War. Valdés discovered that eggs could be replaced by agar-agar, a polysaccharide obtained from the cell wall of various species of algae which acted as a gelling agent. Sold in small sachets, the powder was mixed with milk and a little melted sugar could be added to the bottom of the container. Almost at the same time, another chemist, Jorge Ríos, created the formula for his competitor, *Flanín el Niño*.

Flan chino EL MANDARIN

ESTE FLAN CUAJA AL ENFRIARSE

Mézclase muy bien el contenido del sobre "MANDARIN" con tres cucharadas soperas de azúcar.

Póngase a hervir MEDIO LITRO de leche en un recipiente del cual se separa previamente una tacita para disolver en FRÍO la mezcla.

Cuando hierve la leche, se echa el contenido de la taza y se tiene en ebullición (hirviendo) durante OCHO MINUTOS, removiéndolo continuamente para evitar que se adhiera al recipiente.

Pasados los ocho minutos, se retira del fuego y se bate fuertemente unos instantes para que la mezcla se haga perfecta, y se vierte en un molde cuyo fondo haya sido previamente caramelizado con azúcar tostado.

Déjese enfriar durante DOS horas, al cabo de las cuales habrá tomado la dureza característica del flan de huevo.

FLAN DE DIVERSOS GUSTOS

CANELA. - Agréguese un trocito de canela al hervir.

LIMÓN. - Al mezclar, se añade la corteza rallada de medio limón, cuidando de que no caiga zumo ni pulpa que cortaría la leche.

CAFÉ. - Usando café natural, se hierve previamente con la leche, colándolo bien después para que no queden posos. De emplearse extractos o café en polvo, pueden añadirse en cualquier momento.

FRUTAS. - Si se utilizan frutos frescos (fresas, calabaza, melón, piña, etc.), deben agregarse una vez haya hervido el líquido, es decir, al contrario de los demás casos.

NATILLAS

Utilícese algo más de un litro de leche, mézclase el contenido del sobre con cuatro o cinco cucharadas soperas de azúcar y agreguese esta mezcla a TODA la leche en frío.

Póngase al fuego y téngase dos minutos hirviendo, al retirarlo se bate fuertemente y se deja enfriar dos horas aproximadamente.

BATR NUEVAMENTE y servir en platillos, espolvoreando con canela o azúcar quemado.

HELADOS

Se prepara la mezcla como en el FLAN, pero con UN litro de leche si se desea helado blando para copas, y MEDIO LITRO si se quiere tipo al corte. CINCO cucharadas de azúcar muy finas y un trocito de canela en rama. Si se desea, puede añadirse corteza rallada de limón u otra esencia cualquiera.

Una vez haya hervido OCHO minutos, se deja enfriar un poco con el fin de que no derrieta el hielo y se echa en la heladora, cargándola con cuatro partes de hielo por una de sal gorda, agitándolo hasta encontrar fuerte resistencia (unos veinte minutos) y se observa que ya está helado.

OTROS POSTRES

Son innumerables los postres y meriendas que pueden hacerse con el contenido de este sobre: "EL MANDARIN" así seguro de que los amos de casa sabrán darle todas las muchas aplicaciones que tiene, entre las que destacaremos Relleno de Empanadillas, los Copas de Helado, la Crema de Chocolate, el Flan de Licor, etc.

Flan Chino EL MANDARIN
es un producto fabricado por
AL CON
ALIMENTOS CONCENTRADOS NACIONALES
Apartado 12011 MADRID

09 Flan Chino Mandarín promotional leaflet with instructions for use and suggested recipes, c. 1960. Collection of the author.

The 1950s saw the modernization of the Spanish agricultural and food sector with the appearance of modern industrial complexes. Accordingly, the presence of packaged products likewise increased in a country where food trade had been defined by products being sold loose until then. All these changes required the creation of new logistical infrastructures, and within them special attention was paid to industrial cold. A *Plan for a National Refrigeration Network* began to be drawn up at the end of the 1940s within the National Institute of Industry while in 1951 the Centro Experimental del Frío (Experimental Cold Centre) was created as part of the Consejo Superior de Investigaciones Científicas (CSIC), the Spanish agency for technological development and scientific research launched in 1939.



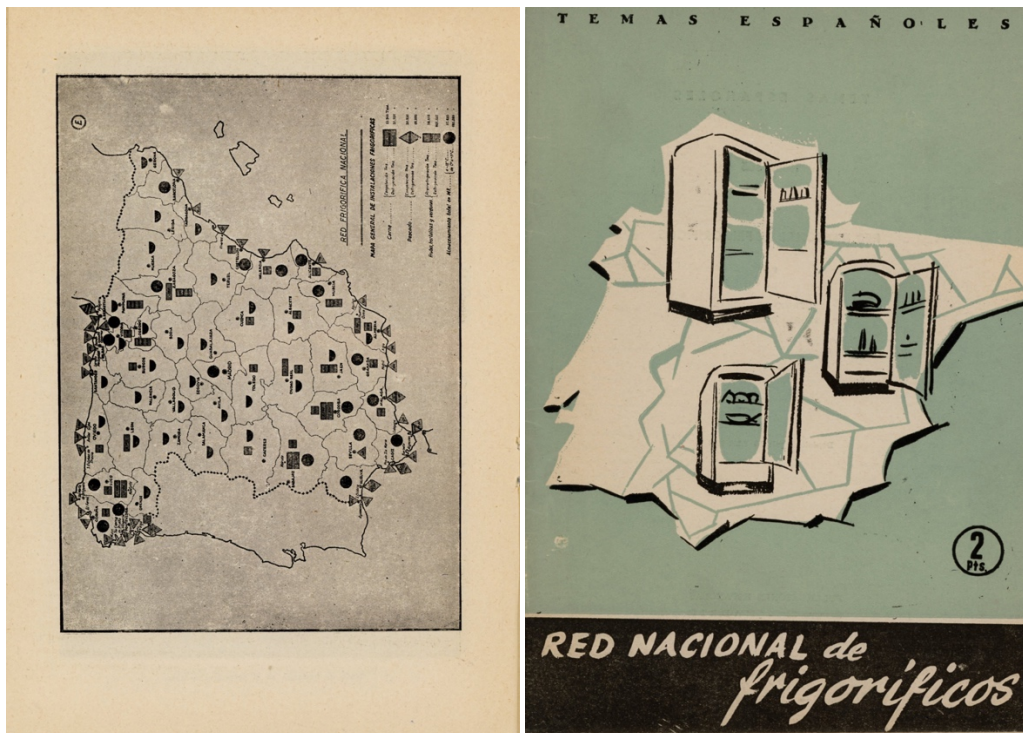
10 COLD AND ITS APPLICATIONS AT THE MADRID EXPERIMENTAL CENTRE. Images from the newsreel NOT N 1519 B (from the Spanish NODO), corresponding to February 14th, 1972. Available in the RTVE archive: <https://www.rtve.es/filmoteca/no-do/not-1519/1469373/>

The centre was located at “the famous Calle Serrano, where Madrid is no longer the populous city of houses crowded on top of each other”, as described in a 1958 magazine. It sat at the building of the research institute Patronato Juan de la Cierva, designed by Ricardo Vallespín and in whose basements thirteen large cabins at different temperatures were used to study the practical applications of cold for Spanish products, especially oranges and lettuces. In 1964, the Centre moved to its new headquarters in the campus of Ciudad Universitaria in Madrid. It is this new building, designed by Manuel Gutiérrez Plaza and Javier de Mesones Cabello, that we can see in action in the propaganda newsreel, NO-DO, of February 14, 1972⁴. Today, the institute and its goals have been absorbed by the Instituto de Ciencia y Tecnología de Alimentos y Nutrición (Institute of Food Science and Technology and Nutrition), where food quality and safety, metabolism and nutrition or new processing methods like high hydrostatic pressure (HHP) are studied. HHP applies pressures between 100 and 1000 MPa to food to destroy microorganisms like bacteria, yeast or enzymes, but unlike traditional thermal methods as pasteurization, it keeps the nutritional and organoleptic qualities of foodstuff intact. In the basements of ICTAN we can still find a series of cold cabins, distant echoes of the centres’ origin, that are nonetheless still relevant to their work.

Industrial Cold

In 1748, the physician William Cullen developed the first method of artificial refrigeration by evaporating ethyl ether in a partial vacuum. As it boiled, it absorbed heat from its surroundings, cooling it and even creating ice. But it was not until well into the nineteenth century that the first compression refrigeration systems were invented (where a refrigerant is evaporated and condensed, compressing it, cyclically). It was not until the end of the century that its commercial use became widespread in slaughterhouses and other areas of the food industry. It was two hundred years later when Franco’s government, pressed by the food and logistical problems besetting the country, started work in the *Plan for a National Refrigeration Network*. In 1948, Artillery Lieutenant Colonel Rufino Beltrán Vivar was commissioned to draw up a plan to organize the cold storage of food products at a national level with the aim of extending the life of perishable foods, harmonizing seasonal production and consumption, and storing surplus or imported foods to cover the national deficit.

⁴ NO-DO, an acronym for Noticario y Documentales (News Programme and Documentary), was a weekly propaganda newsreel produced by Francisco Franco’s regime and shown in the film theatres of the country. Today, it is a unique archive of life under the dictatorship which can be freely accessed at the website of RTVE, the Spanish public broadcasting network.



11 General Map of Refrigeration Installations corresponding to the National Refrigeration Network planned by the INI (National Institute of Industry), c. 1950. Published by Federico Villagrán and Antonio Gómez Alfaro, in the magazine *Temas Españoles*, No 365, 1958. Collection of the author.

Beltrán, well experienced after his years leading the General Commissariat of Supplies, organized the plan around two chains—one for meat and fish, and a second one for other perishable foods—and six kinds of cold stores: rural, production, commercial, distribution, consumer stores and refrigerated transport. The former, located within territories of production, was the entry point into the network, and could be individual or collective, managed by guilds or producers' associations. The latter had greater capacity and had to be located in well-connected towns. If they were close to meat production, they would be associated with slaughterhouses. For fruit and vegetable production, they would include cooling equipment, and when they were close to fishing areas, they would also have freezing plants.

Commercial cold stores were intended to store surpluses for export as well as products imported from abroad, so it was preferable for them to be located in seaports. Distribution refrigerators would be in large cities, close to transport routes to receive food from production areas and store it. The distribution refrigerators were combined with smaller ones, consumer cold stores, in major towns for short-term storage. Finally, a fleet of climate conditioned train wagons and refrigerated lorries was to be created to enable transport from one facility to another in the network. Despite being one of the first and largest sectoral planning efforts in Spain, tensions between the government's desire for control and private initiatives put an end to the plan.

LOS SUPERMERCADOS A RAYOS X

TODO LO QUE TIENEN QUE SABER LAS AMAS DE CASA

SUPERMERCADOS, AUTOSERVICIOS Y LOS COMERCIANTES DE ULTRAMARINOS

CONTINUACION

Después de este pequeño estudio de los supermercados, autoservicios y comerciantes de ultramarinos, es el turno de los comerciantes de ultramarinos, que en los últimos años han sufrido una transformación radical, pasando de ser pequeños negocios de barrio a grandes establecimientos que ofrecen una gran variedad de productos.

En primer término, ya hemos señalado en anteriores artículos que la principal dificultad que se presenta al intentar establecer un negocio de este tipo es la falta de información que se posee acerca de los hábitos de consumo de la clientela que se pretende atender.

De lo que no cabe duda es que, cuando se trata de establecer un negocio de este tipo, el éxito depende en gran medida de la capacidad de adaptación del comerciante a las necesidades de la clientela.

En el caso en el que los comerciantes no han dudado en aceptar el desafío de su transformación en grandes establecimientos, ya hemos señalado en anteriores artículos que la principal dificultad que se presenta al intentar establecer un negocio de este tipo es la falta de información que se posee acerca de los hábitos de consumo de la clientela que se pretende atender.

De lo que no cabe duda es que, cuando se trata de establecer un negocio de este tipo, el éxito depende en gran medida de la capacidad de adaptación del comerciante a las necesidades de la clientela.

NOTICIAS, CURIOSIDADES, INFORMACIONES

JOVEN HISTORIA DE LOS SUPERMERCADOS EN ESPAÑA

— Su historia y evolución en el mundo —

Contenido: Mercado PILOTO DE BARCELONA - Octubre

CONTINUACION

Ya lo verá usted si a un kilo de azúcar le va a caer un kilo de carne por esa vez. Se vendió a un precio que, si se reparte entre las familias de Madrid y de los demás puntos de España, no van a permitir que por 25 pesetas y un pequeño botellín, se alimenten.

En una prueba de aceptación que se hizo en el barrio de San Isidro, se demostró que la gente estaba dispuesta a pagar más por un producto que se sabía que era de buena calidad.

Un consejo al ama de casa

Se le invita a salir, pero usted en casa. Tome una tableta de UNIDOR, a las pocas minutos estará usted dispuesta y optimista.

UNIDOR, el tablete mágico ¡Te ayuda siempre o monol!

¡Adiós al dolor!

NOTA.—Si además de eliminar sus molestos dolores, usted quiere beneficiarse un poco más, tome UNIDOR en forma de bebida.

12 Two pages from the report "Los supermercados a rayos X", published in No 12 of the magazine AMA, the magazine of Spanish housewives, corresponding to 1 July 1960. Collection of the author.

More elaborate processed foods were introduced into everyday life enabled by new infrastructure, advertising and changes in retail distribution with the appearance in the 1960s of the first supermarkets, a feature of the Americanization of food distribution in Europe after the war. These new retail spaces were a key presence in women magazines of the time, and the NO-DO newsreel of December 29, 1958, showed the inauguration of the country's first supermarket in Madrid's Calle Embajadores. Installed by the General Commissariat of Supplies, it had a "large, well-lit hall" where "stalls are set up in the most orderly and efficient manner [and] the public is free to choose the products on sale." At the exit there were "six checkout counters where you pay for your purchases after returning the baskets that were used to collect the products."



13 Inauguration In Madrid Of The First Supermarket In Calle Embajadores. Images from the newsreel NOT N 834 B (from the Spanish NO-DO), corresponding to December 29th, 1958. Available in the RTVE archive: <https://www.rtve.es/filmoteca/no-do/not-834/1487133/>

Impulses

Both Flan Chino Mandarin and Flanín el Niño still exist in supermarkets. The first is marketed by Dr. Oetker (Germany, 1891, unlisted company), the second by Maizena, which is owned by Unilever (UK, 1929, LON: ULVR - 51.18+0.08 [+0.16%]↑). In the 1960s, Roland Barthes published a text advancing a possible psychosociology of contemporary food, in which he pointed out that food, apart from signifying the food we eat for our physical survival, is “also and at the same

time a system of communication, a body of images, a protocol of uses, situations and behaviours.” Indeed, we see how these companies have sought to preserve a social sign built over decades through jingles, recipes, advertisements and even dolls⁵. Although these puddings’ formula has changed and adapted to contemporary tastes and means, the social sign is an asset in the battlefield of the supermarket shelves where complex ecologies of communication and attention are studied and designed.

Understanding how these social signs work, communicate and influence the customer, analysing the efficiency of different spatial settings in a supermarket, or capturing how clients take decisions as they drift through these ecologies is an essential step in the design of more profitable infrastructural semiotics. Marketing consultant Herb Sorensen started tracking consumers behaviours in US retail stores in the early 2000s. The first method used was adding RFID tags on the shoppers’ carts or baskets and antennas on the ceiling of the shop to track their paths. This information was later crossed with their purchased items to understand where the individual had gone around the cart. Visual tracking was then added, either through cameras surveilling the space, shadowing the shoppers and digitally registering their every movement or with eye-tracking technology, where it is the consumer’s gaze that’s followed. Eye-tracking studies are carried out by means of sensors installed in glasses—though 3D eye-tracking cameras are also used—directing a beam of near-infrared light at the pupils, producing a visible reflection on the cornea that is recorded by a camera.

Contemporary neuromarketing performs the double task of translation between physical and digital signs, between the characteristic blurriness of the material world and the high precision of new technologies. First, the impulses from the consumer’s optic nerve are converted into “gaze points”. Using a frequency of 60 Hz, for example, we obtain 60 such points per second. Wherever we have an accumulation of these gaze points, a “fixation point” appears. These allow heat maps to be generated over the image the consumer is viewing, highlighting the most viewed areas. “Areas of interest” (AOI) allow you to select an area of the visual stimulus (like supermarket shelves) to extract specific metrics about it, like “time to first fixation” (TFFF), which indicates the time it takes for the consumer to look at a given AOI from the start of the stimulus.

Then there are numerous metrics, “first fixation duration”, “average fixation duration”, “revisits” or “last fixation”, that usually coincide with the chosen object. The fixation sequences allow us to understand the order and movement of the gaze, understanding not only what has been seen but also the temporal and fixation order in which it has been seen. Secondly, in the aforementioned translation process, all these metrics are codified in design protocols applicable from packaging to advertising or the layout of the supermarket spaces. These

⁵ Flan Chino Mandarin used a series of plastic dolls following different stereotypes of Chinese people in its advertising campaigns. They were produced by the pudding’s creator José Ferro, whose main line of business would end up being plastic (for the production of pipes).

protocols are usually constructed in the form of lists that function as checklists for the designer to check whether a design complies or not, as well as charts and databases with colour, dimensions, or positional values tables which define the supermarket as an ecology of signs. These protocols are then easily codifiable into computer models and/or BIM design programmes.

Semiotic Daze

In addition to these ecologies of multisensory nudging, as consumers we must also navigate the semiotic landscape of food labelling, which is often incomprehensible to the average citizen. A simple example is to compare Duff's gingerbread patent, which listed 9 ingredients, with a contemporary baking mix we can find in one of the main supermarket chains in Spain. Dr. Oetker's chocolate cake mix includes almost 30 ingredients, many of them difficult to recognize at first sight by the average consumer (Ingredients: Milk chocolate (28 percent) (sugar, cocoa butter, MILK powder, cocoa mass, emulsifier (SOYA lecithin), flavouring), chocolate powder (sugar, cocoa), sugar, WHEAT flour, raising agents (E500, E341), emulsifiers (E471, E472a, E470a, E472e, E477, E472b, E482), glucose syrup, stabilizers (E450, E340), fully hydrogenated palm kernel fat, maltodextrin, skimmed MILK powder, MILK proteins, salt, flavouring). If we turn to the additives database of the OCU, one of the biggest consumer associations in Spain, we see that, among the rising agents, there is E500 (OCU: Acceptable / Green) which corresponds to sodium carbonate, acting as an acidity regulator, anti-caking agent, leavening agent, stabilizer or thickener. It is obtained by synthesizing sodium chloride (common salt), ammonia, and calcium carbonate. There is also E341 (OCU: Not recommended / Orange) which is calcium phosphate, used primarily as an antioxidant, functioning also as an acidity regulator, anti-caking agent, emulsifier, gelling agent, sequestering agent, stabilizer or thickener. Among the emulsifiers, which facilitate the formation of a homogeneous mixture, we find E471 (OCU: Not recommended / Orange) which is an agent that corresponds with the monoglycerides and the diglycerides of fatty acids, that in pastry making slow down the leaking of fats from the dough. Also in the mix are E472a (OCU: Not recommended / Orange), or the acetic esters of monoglycerides and diglycerides of fatty acids, E477 (OCU: Not recommended / Orange), or the acetic esters of monoglycerides and diglycerides of fatty acids, E477 (OCU: Not recommended / Orange), or the propane-1.2-diol esters of fatty acids, and E472b (OCU: Not recommended / Orange), or the lactic acid esters of monoglycerides and diglycerides of fatty acids; all are used to extend the time a material retains its moisture or to make solids from liquids, among other things. The list continues with E470a (OCU: Tolerable / Yellow) corresponding to sodium, potassium and calcium salts of fatty acids, which can be used as non-stick or coating agents; E472e (OCU: Not recommended / Orange), corresponding to monoacetyl and diacetyl tartaric esters of monoglycerides and diglycerides of fatty acids, and E482 (OCU: Not recommended / Orange), corresponding to calcium lactates or calcium stearoyl-2-lactylate, which are often used in bakery products to obtain a softer crumb texture, to avoid the appearance of bubbles or to increase the volume of the products.

Finally, among the stabilizers, whose function is to maintain the integrity of the product and prevent its components from separating, we find E450 (OCU: Not recommended / Orange), which corresponds to diphosphates synthetically derived from phosphoric acid, and E340 (OCU: Not recommended / Orange), or potassium phosphate.

Immersed in this semiotic daze the consumer is required to be in a constant state of alert, and labelling becomes a conflictual and political space that represents, at the smallest of scales, the negotiations and adaptive processes behind the legal frameworks informing our foodscapes. Per Article 2, *Definitions*, of EU Regulation 1169/2011 on the provision of food information to consumers, labelling “means any words, particulars, trademarks, brand name, pictorial matter or symbol relating to a food and placed on any packaging, document, notice, label, ring or collar accompanying or referring to such food.” Traceability labelling, which is essential, is also the most direct form of communication between producers and consumers. This easily explains the conflicts and difficulties that arise in unifying criteria, since broadening or clarifying the consumer's (formerly citizen's) range of possibility through the information provided therein becomes a much-needed compass to navigate an increasingly complex food supply network. We have reached a moment in which achieving a minimum readable font size to transmit this information has become a feat. Arriving to the Annex IV of the aforementioned regulation which helps define the minimum size of a label font (“equal to or greater than 1,2 mm”) is part of the minor epics of contemporary food politics.

With these thorough legal texts, AESAN, EFSA, and the European Parliament design our foodscapes in a decisive manner, codifying what is possible and not within the food chain. By delineating fields of possibility, these laws, codes and protocols, as well as their distributed human enactors, from lab technicians to food safety inspectors, help set what is deemed the right way of producing food within the European territories. Relatively narrow for some and too wide for others, this space within which only certain ingredients, practices or processes are possible is dynamic and under constant revision, not only through alert systems like the EU's Rapid Alert System for Food and Feed, but through scientific bodies as the AESAN's Scientific Committee. This independent panel, made up of scientists from a wide range of fields such as food technology, medicine, chemistry, medicine or nutrition, is responsible for assessing existing risks and identifying emerging ones, thus pre-informing the semiotic landscapes of food.

ANNEX IV

DEFINITION OF x-HEIGHT

x-HEIGHT



Legend

1	Ascender line
2	Cap line
3	Mean line
4	Baseline
5	Descender line
6	x-height
7	Font size

14 Annex IV, DEFINITION OF x-HEIGHT, from the Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 **on the provision of food information to consumers**, amending Regulations (EC) No 1924/2006 and (EC) No 1925/2006 of the European Parliament and of the Council, and repealing Commission Directive 87/250/EEC, Council Directive 90/496/EEC, Commission Directive 1999/10/EC, Directive 2000/13/EC of the European Parliament and of the Council, Commission Directives 2002/67/EC and 2008/5/EC and Commission Regulation (EC) No 608/2004

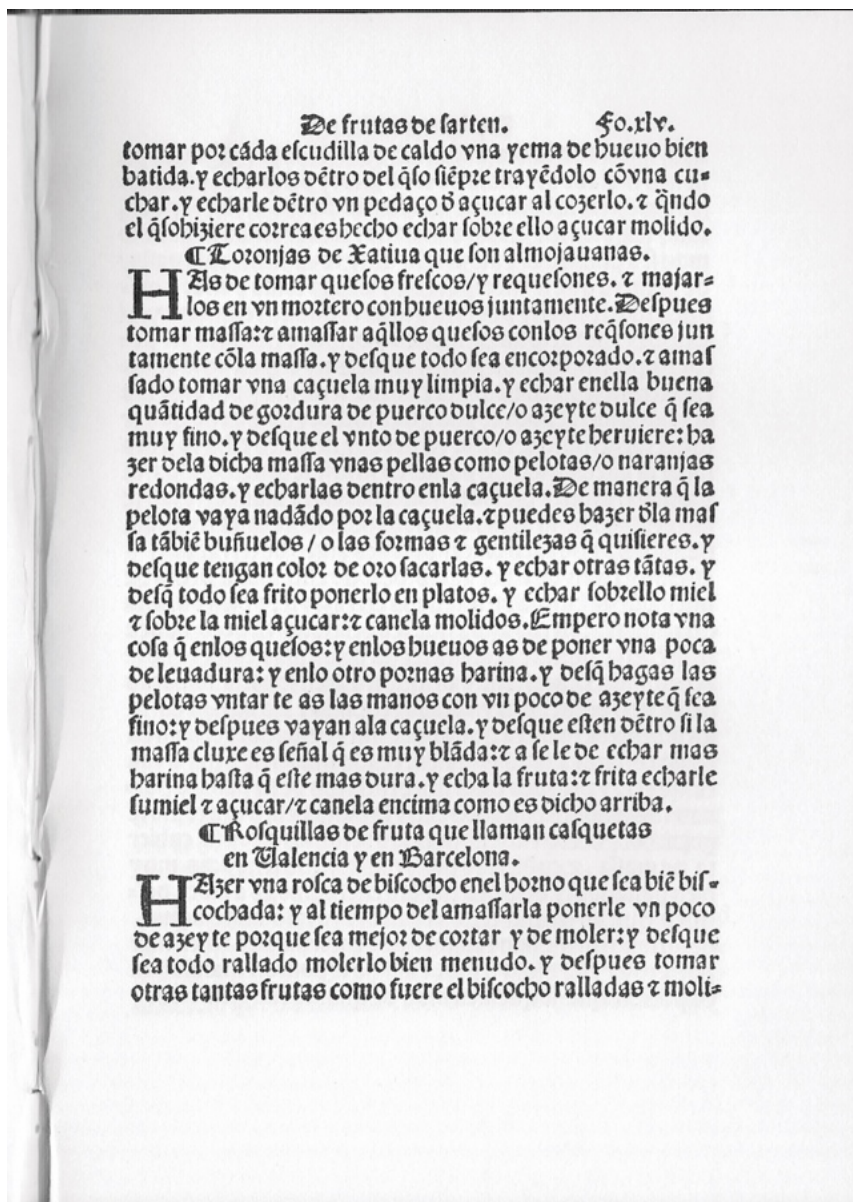
III. RECIPES

Honey has played a crucial role in Andalusian sweets, especially among those that are less elaborate which could be found in the souks of the cities and in the tables of the working classes around the twelfth century. Fritters and almojábanas were the most popular. The only difference between them is the cheese used in the latter, hence their name, which comes from the Arabic *al-muʿabbanat* (the one with cheese, *ʿubn*).

Almojábanas were famous in the region of Jerez, and there was a saying that “to go to Jerez and not eat almojábanas is a sin.” They first appear in two thirteenth century Andalusian recipe books. The first is a disorderly and anonymous accumulation of recipes with notes on Hippocrates, table service, and syrups. It offers seven recipes for almojábanas (“Ruqāq’s way”, plain, “with eggs”, “*terciada*”, “with semolina”, and “baked, which is known among us as almojábana toledana”). The second book in which we find the almojábana is in “The virtue of the table in the goodness of food and colours” by the Murcian scholar Ibn Razīn al-Tuʿyībī, who wrote this recipe book from exile in Tunisia, once Murcia had fallen to the kingdom of Castile, with the aim of preventing Andalusian cuisine from being lost.

Andalusian almojábanas appear in the very first recipe book published in Spain, the *Libre de doctrina per a ben servir, de tallar y del art de coch* (A book of doctrine for good serving, cutting and the art of cooking) by the cook Ruperto de Nola. Published in Barcelona in 1520, it had Catalan, Italian, French, and Arabic influences. In 1525 the first fully Spanish translation, *Libro de guisados y potajes*, or “Book of Stews and Vegetable Soups,” was printed in Toledo. The first printed instructions for almojábanas appears in these two books under the title *Toronjas de Xativa que son almojavanas* (Pan fruits from Xativa which are almojavanas)⁶. There are also other variants such as *Queso fresco revanado para fruta de farten* (Fresh sliced cheese for pan fruit, fo. XLVIII) or *Fruta de queso fresco* (Fresh cheese fruit, fo. XLVII), where lard is used, which had historically been the traditional frying fat in Christian territories, as opposed to the olive oil used in Al-Andalus.

⁶ In Spanish, a pan or frying pan fruit refers to a flour pastry, to which eggs and sugar might be added. It is made in different shapes and finally fried in lard or oil. In Xativa, those were called *toronjas*.



15 *Libro de Cocina*, compuesto por maestro Ruberto de Nola, Toledo, 1525. Biblioteca Nacional de España (R/6918).

These texts make us think of the recipe as a singular textual form, a genre that defines fields of possibility and which has subsequently played a fundamental role in the evolution of infrastructural semiotics. In Spanish, the term *receta* comes from the Latin verb *recipere*, which means “to take, to catch,” and which forms the noun *recepta*, in the sense of “things taken” to make a composition. These compositions were originally used in medicine, from where the term was then adopted, two fields—cooking and medicine—which often overlapped in the Classic world and the Middle Ages. In recipes such as those of Ruperto de Nola, or those of the Andalusian treatises, there is no list of ingredients, something that would not become standardized until well into the eighteenth century, but neither is there any mention of quantities, except in some confectionery recipes where the use

of sugar or honey, to which curative powers were attributed, placed them in the no-man's land between the realms of apothecaries and cooks.

In the cooking recipe, it was taken for granted that the cook would have the experience to interpret the text without the need for specific measurements⁷. Recipes are not conceived to replicate an ideal, instead they offer orientation in a medium filled with distinctive signs that the cook has to decipher to take advantage of. This explains the diversity of recipes that we find today under the name of *almojábana*, from fritters to buns or cakes, sometimes fried and sometimes baked.

Although the recipe is always articulated in the imperative, as an order, it does not function as a prescriptive text, but as the linguist Algirdas Greimas has argued, as a score or a plan to follow. It does not belong to a *must-do*, but gently supports or makes possible, thus working as a *know-how*. This prescriptive nature also relates recipes to algorithms in that both consist of a series of steps to be followed to solve a problem. In both cases, a discretization of the instruments is necessary, starting with the measurements and ending with the procedures, generating standards that are easy to interpret (decode).

```

Chef
-----
Introduction
Chef is a programming language in which programs look like recipes.
NEW: Additional syntax specifications added 17 July 2003, marked in red. Fixed spelling of "lightly" keyword.
Design Principles
Program recipes should not only generate valid output, but be easy to prepare and delicious.
Recipes may appeal to cooks with different budgets.
Recipes will be metric, but may use traditional cooking measures such as cups and tablespoons.
Language Concepts
Ingredients
All recipes have ingredients! The ingredients hold individual data values. All ingredients are numerical, though they can be interpreted as Unicode for I/O purposes. Liquid ingredients will be output as Unicode characters, while dry or unspecified ingredients will be output as numbers.
Mixing Bowls and Baking Dishes
Chef has access to an unlimited supply of mixing bowls and baking dishes. These can contain ingredient values. The ingredients in a mixing bowl or baking dish are output, like a stack of pancakes. New ingredients are placed on top, and if values are removed they are removed from the top. Note that if the value of an ingredient changes, the value in the mixing bowl or baking dish does not. The values in the mixing bowls and baking dishes also retain their dry or liquid designations. Multiple mixing bowls and baking dishes are referred to by an ordinal identifier - the "2nd mixing bowl". If no identifier is used, the recipe only has one of the relevant second. Ordinal identifiers must be digits followed by "st", "nd", "rd" or "th", not "s".
Syntax Elements
The following items appear in a Chef recipe. Some are optional. Items must appear in the order shown below, with a blank line (two newlines) between each item.
Recipe Title
The recipe title describes in a few words what the program does. For example: "Hello World Scuffle", or "Fibonacci Numbers with Caramel Sauce". The recipe title is always the first line of a Chef recipe, and is followed by a full stop.
Comments
Comments are placed in a free-form paragraph after the recipe title. Comments are optional.
Ingredient List
The next item in a Chef recipe is the ingredient list. This lists the ingredients to be used by the program. The syntax is
ingredient-name [measure-type] measure ingredient-name
[Further ingredients]
Ingredients are listed one per line. The initial number is a number, and is optional. Attempting to use an ingredient without a defined value is a run-time error. The optional measure can be any of the following:
• g | kg | pinch[ies] : These always indicate dry measures.
• ml | l | dash[ies] : These always indicate liquid measures.
• count | countable | countable[ies] : These indicate measures which may be either dry or liquid.
The optional measure type may be any of the following:
• none | none : These indicate that the measure is dry.
The ingredient name may be anything reasonable, and may include space characters. The ingredient list is optional. If present, it declares ingredients with the given initial values and measures. If an ingredient is repeated, the new value is used and previous values for that ingredient are ignored.
Cooking Time
Cooking time: time (hour[s] | minute[s]).
The cooking time statement is optional. The time is a number.
Oven Temperature
Preheat oven to temperature (degrees Celsius | degrees Fahrenheit).
Some recipes require baking. If so, there will be an oven temperature statement. This is optional. The temperature and unit are numbers.

```

```

Method
Method:
method statement
The method contains the actual recipe instructions. These are written in sentences. Line breaks are ignored in the method of a recipe. Valid method instructions are:
• take ingredient from container.
This marks a numeric value from STDIN into the ingredient named, overwriting any previous value.
• fill ingredient (size) [mixing bowl].
This puts the ingredient into the mixing bowl.
• fill ingredient (size) [baking dish].
This stores the top value from the mixing bowl and places it in the ingredient.
• add ingredient (to) [mixing bowl].
This adds the value of ingredient to the value of the ingredient on top of the mixing bowl and stores the result in the mixing bowl.
• mix ingredient (from) [mixing bowl].
This subtracts the value of ingredient from the value of the ingredient on top of the mixing bowl and stores the result in the mixing bowl.
• combine ingredient (into) [mixing bowl].
This multiplies the value of ingredient by the value of the ingredient on top of the mixing bowl and stores the result in the mixing bowl.
• divide ingredient (into) [mixing bowl].
This divides the value of ingredient into the value of the ingredient on top of the mixing bowl and stores the result in the mixing bowl.
• add dry ingredients (to) [mixing bowl].
This adds the values of all the dry ingredients together and places the result into the mixing bowl.
• lightly | lightly ingredient.
This turns the ingredient into a liquid, i.e. a Unicode character for output purposes. (Note: The original specification used the word "lightly", which is a spelling error. "lightly" is deprecated. Use "lightly" in all new code.)
• lightly | lightly (count) of (size) [mixing bowl].
This turns all the top number ingredients in the mixing bowl into a liquid, i.e. a Unicode character for output purposes.
• fill (size) [mixing bowl] (for number) number.
This fills the number of ingredients in the mixing bowl equal to the value of ingredient, such that the top ingredient goes down that number of ingredients and all ingredients above it rise one place. If there are not that many ingredients in the bowl, the top ingredient goes to the bottom of the bowl and all the others rise one place.
• mix (size) [mixing bowl] until.
This randomizes the order of the ingredients in the mixing bowl.
• clean (size) [mixing bowl].
This removes all the ingredients from the mixing bowl.
• pour contents of the (size) mixing bowl into the (size) baking dish.
This copies all the ingredients from the mixing bowl to the given baking dish, retaining the order and putting them on top of anything already in the baking dish.
• mark the ingredient.
This marks the beginning of a loop. It must appear as a matched pair with the following statement. The loop executes as follows: The value of ingredient is checked. If it is non-zero, the body of the loop executes until it reaches the "until" statement. The value of ingredient is checked. If it is non-zero, the loop executes again. If at any check the value of ingredient is zero, the loop ends and execution continues at the statement after the "until". Loops may be nested.
• mark (the ingredient) until (value).
This marks the end of a loop. It must appear as a matched pair with the above statement. value must match the mark in the matching loop start statement. The mark in the statement may be optional and is ignored. If the ingredient appears in the statement, its value is decremented by 1 when this statement executes. The ingredient does not have to match the ingredient in the matching loop start statement.
• do until.
This causes execution of the innermost loop in which it occurs to end immediately and execution to continue at the statement after the "until".
• show with number of digits.
This invokes a non-chef to immediately prepare the named auxiliary recipe. The calling chef waits until the non-chef is finished before continuing. See the section on auxiliary recipes below.
• ingredients (for number) (times).
This causes execution of the recipe in which it appears to end immediately. If it is an auxiliary recipe, the auxiliary recipe ends and the non-chef's first mixing bowl is passed back to the calling chef as normal. If a number of times is specified, the recipe will print out its first number baking dishes (see the serves statement below) before ending.
Serves
The final statement in a Chef recipe is a statement of how many people it serves.
serves number-of-dishes.
The statement serves is a keyword that contains the first number of dishes baking dishes. It begins with the 1st baking dish, removing values from the top one by one and printing them until the dish is empty, then progresses to the next dish, until all the dishes have been printed. The serves statement is optional, but is required if the recipe is to output anything.
Auxiliary Recipes
These are small recipes which are needed to produce specialized ingredients for the main recipe (such as sauces). They are listed after the main recipe. Auxiliary recipes are made by non-chef, so they have their own set of mixing bowls and baking dishes which the host Chef never sees, but take copies of all the mixing bowls and baking dishes currently in use by the calling chef when they are called upon. When the auxiliary recipe is finished, the ingredients in its first mixing bowl are placed in the same order into the calling chef's first mixing bowl.
For example, the main recipe calls for a sauce at some point. The sauce recipe is begun by the non-chef with an exact copy of all the calling chef's mixing bowls and baking dishes. Changes to these bowls and dishes do not affect the calling chef's bowls and dishes. When the non-chef is finished, he passes his first mixing bowl back to the calling chef, who copies it into his first mixing bowl.

```

16 Chef Programming Language information page on its author's, David Morgan-Mar, website [dangermouse.net](https://www.dangermouse.net) (<https://www.dangermouse.net/esoteric/chef.html>)

⁷ To the point of considering the idea of needing precise measurements as insulting to one's own mastery.

We also find the use of the conditional (`if...else`) to allow the input of alternatives and variants, allowing the recipe to be viewed as a potential flowchart (as executed by Sami Matilainen in *Flowchart Recipes - An Engineer's Cookbook*). They also share the call to other functions (`func {}`), such as when a recipe makes use of a stock or sauce that has been explained in another recipe without needing to be explained in the new one. With these similarities in mind, physicist David Morgan-Mar invented the Chef programming language in 2002. Its programs take the form of recipes, and they “should not only generate valid output, but be easy to prepare and delicious.”

From the Household Economy to Home Economics

Over time, measurements and instructions became more precise, moving from a soft prescription open to interpretation (“add as much water as the mixture calls for”), to codified and digitized forms of direction (“X units of water”) in which there is no room for ambiguity, uncertainty, or interpretation. Recipes became a sequence of steps to be followed, with their inputs and outputs, which the user gradually reads as a contract where if they follow certain steps, the result will always be the same. This evolution can be clearly seen in the role that recipes, not only for cooking, but also for medicinal remedies, cleaning products or household management, played in the books on domestic economy that became popular in the eighteenth century. In these programmatic books, created for the promotion of certain moral and social customs, the recipe acquires an infrastructural function, standardizing certain ways of doing things.



17 *Oeconomus Prudens et Legalis Oder Allgemeiner Klug- Und Rechts-Verständiger Haus-Vatter*, Franz Philipp Florin, Nürnberg, 1705. München, Bayerische Staatsbibliothek. <https://www.digitale-sammlungen.de/en/details/bsb10214489>

In Germany, we find huge tomes filled with advice on agriculture, animal husbandry and hunting, as well as on marriage and cooking. The *Oeconomia ruralis et domestica oder Haußbuch* by Johann Coler, published at the beginning of the sixteenth century, was a major success. Another was the *Oeconomus prudens et legalis* by Franz Philipp Florinus, which, in its 1719 edition, had more than 1500 pages and covered everything from house building to beekeeping.

In England, so-called Household Books were in use from the sixteenth century onwards and contained recipes, remedies, and other advice. These manuscripts were compiled by the ladies of each house (or one of their employees) and contained materials from a wide variety of sources. The origin of each piece of advice was indicated in each text to confer the authority of its creator. For example, the title of one of these recipes is “To make Lemon Cream the Lady Warwicke Way.” These books were presented as collections of loose sheets that grew over the years, and even over several generations, in such a way that they became an expression of the practical knowledge of a living community of crossed trusts and reputations, where knowledge was refined and reinterpreted with the passing of time.

In the eighteenth century, printed editions of similar content began to be published. In them authority was no longer conferred by a living community but by an abstract consensus offered by the market. In books such as *The Complete Family Piece: And Country Gentleman, and Farmer's Best Guide* (1736), *The British Housewife: Or, the Cook, Housekeeper's, and Gardiner's Companion* (1756) or *The Country Housewife's Family Companion* (1750), knowledge is articulated in the manner of the encyclopaedia, with minute descriptions. Nothing is left to chance or interpretation as was previously the case. This detail helps secure the acquired contract, for it conveys an authority which no longer comes from the unique practice of a given house, but as the resulting average of many analysed practices. There's a new statistical and scientific authority which the buyer can trust. They don't have to know it all, they only have to follow—to obey—the rules, timetables, instructions or recipes, allowing the infrastructural quality of these semiotics to carry them along. By doing so, the text challenges the reader, assigning them a responsibility towards moral and social improvement in the face of this new abstract community.

In Spain there were similar books, although in smaller numbers and with less social impact. The *Manual de Economía Casera o Elementos del Gobierno de una Casa* (1787) by the nobleman Phelipe Cosío stands out. It seeks to apply reason to the good governance of estates in order to ensure their benefits and the wellbeing of their inhabitants. Also of interest are two manuscripts by Francisco Magallón Beaumont y Navarra, V Marquis of San Adrián, entitled *Manual de economía doméstica* (1772). The first is addressed to the father of the family and the second to the mother. While the former is organized around the outside world – business, travel, agriculture, stockbreeding – and the need for physical strength, the latter corresponds to the government of the interior, covering questions of cooking, service, cleaning, small livestock, trousseau or the custody of keys, and the care of locks.

Manual de economía doméstica más directamente para la Madre de familia.
 Parte Segunda o bre ejemplo
 Perteneciente también como libro de la Biblioteca de familia
 Año 1772

Parte Segunda de lo perteneciente al Padre de familia.

Artículo 29. De lo general de su casa de estado de casa de casa fol. 262

Artículo 30. De las demas cosas fol. 271

Artículo 31. De las vajillas y primicias de la cocina y de sus cosas fol. 280

Artículo 32. De lo que se cita en la cocina y de vajillas y cosas necesarias fol. 288

Artículo 33. De lo que se compra directamente fol. 306

Artículo 34. De lo que se compra de gajetas de las provisiones fol. 321

Artículo 35. De lo que se compra y modo de conservar las cosas fol. 336

Artículo 36. Como se adquiere de todo la Madre de familia, y como se mantiene y becañona es de buen orden y comendado las cosas fol. 347

Artículo 37. De lo que se necesita para el buen manejo de la casa fol. 357

Artículo 38. De lo que se necesita para el buen manejo de la casa fol. 362

Artículo 39. De las cosas de guardar, conservar sus granos y de otros fol. 362

Artículo 40. De las cosas de guardar y de otros fol. 362

Artículo 41. De lo que se necesita para conservar el orden de la casa y de las cosas que se necesitan para el buen manejo de la casa fol. 381

Artículo 42. De lo que se necesita para el buen manejo de la casa fol. 387

Artículo 43. De lo que se necesita para el buen manejo de la casa fol. 394

Artículo 44. De lo que se necesita para el buen manejo de la casa fol. 414

Artículo 45. De lo que se necesita para el buen manejo de la casa fol. 413

Artículo 46. De lo que se necesita para el buen manejo de la casa fol. 424

Artículo 47. De lo que se necesita para el buen manejo de la casa fol. 437

Artículo 48. De lo que se necesita para el buen manejo de la casa fol. 444

Manual de economía doméstica más directamente para el Padre de familia.
 Parte primera
 Perteneciente también como libro de la Biblioteca de familia
 Año 1772

Indice de los artículos de este manual de economía doméstica.

Parte primera más directamente para el Padre de familia.

Artículo 1. De lo que se necesita para el buen manejo de la casa fol. 004

Artículo 2. De lo que se necesita para el buen manejo de la casa fol. 004

Artículo 3. De lo que se necesita para el buen manejo de la casa fol. 007

Artículo 4. De lo que se necesita para el buen manejo de la casa fol. 042

Artículo 5. De lo que se necesita para el buen manejo de la casa fol. 042

Artículo 6. De lo que se necesita para el buen manejo de la casa fol. 049

Artículo 7. De lo que se necesita para el buen manejo de la casa fol. 065

Artículo 8. De lo que se necesita para el buen manejo de la casa fol. 084

Artículo 9. De lo que se necesita para el buen manejo de la casa fol. 088

Artículo 10. De lo que se necesita para el buen manejo de la casa fol. 096

Artículo 11. De lo que se necesita para el buen manejo de la casa fol. 110

Artículo 12. De lo que se necesita para el buen manejo de la casa fol. 110

Artículo 13. De lo que se necesita para el buen manejo de la casa fol. 115

Artículo 14. De lo que se necesita para el buen manejo de la casa fol. 122

Artículo 15. De lo que se necesita para el buen manejo de la casa fol. 137

Artículo 16. De lo que se necesita para el buen manejo de la casa fol. 145

Artículo 17. De lo que se necesita para el buen manejo de la casa fol. 151

Artículo 18. De lo que se necesita para el buen manejo de la casa fol. 162

Artículo 19. De lo que se necesita para el buen manejo de la casa fol. 171

Artículo 20. De lo que se necesita para el buen manejo de la casa fol. 203

18 Pages extracted from the manuscripts *Manual de Economía Doméstica más Directamente para la Madre de Familia* (Home Economics Manual Specifically Addressed to the Mother of the Family) and *Manual de Economía Doméstica más Directamente para el Padre de Familia* (Home Economics Manual Specifically Addressed to the Father of the Family), by Francisco Magallón y Beaumont, V Marqués de San Adrian, 1772. Biblioteca Digital de Navarra. <https://binadi.navarra.es/registro/00008276>; <https://binadi.navarra.es/registro/00008291>

This interplay of the realms of the interior and the exterior is at the heart of the connections between home economics and capitalism. Many of these manuals compiled and updated knowledge from the classical treatises on *oconomia*, which in Latin meant the management or administration of a

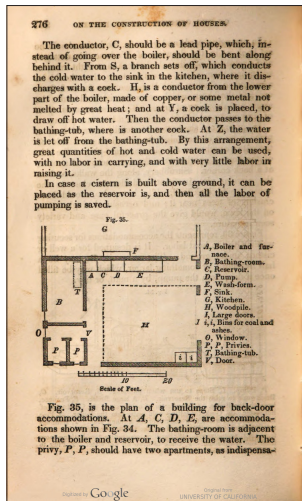
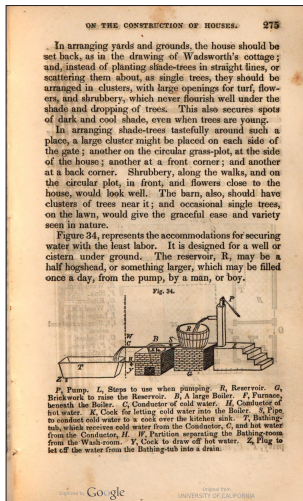
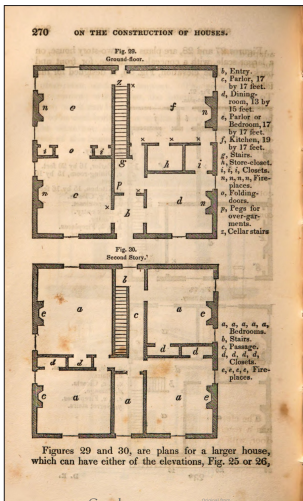
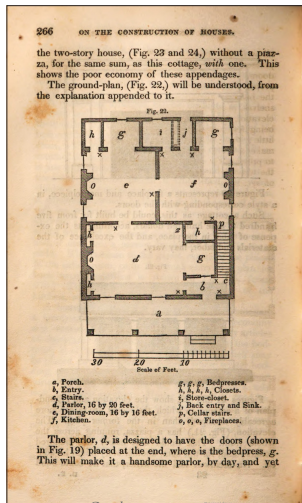
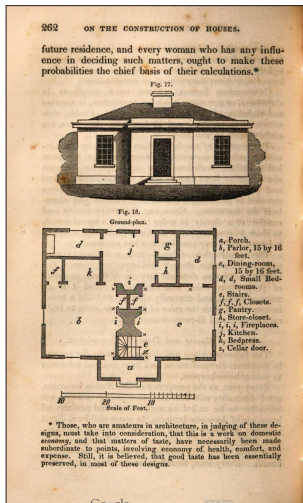
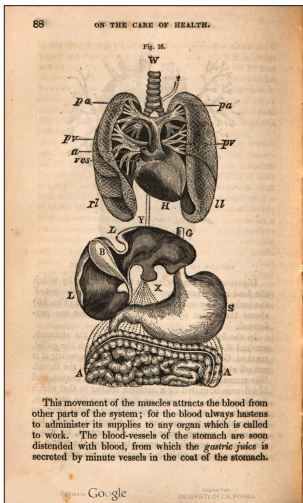
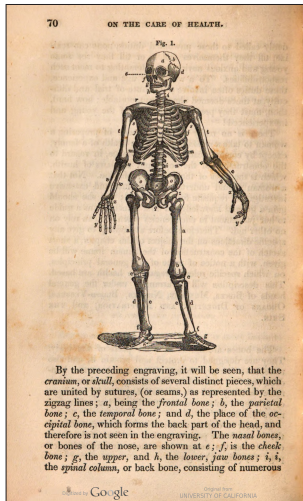
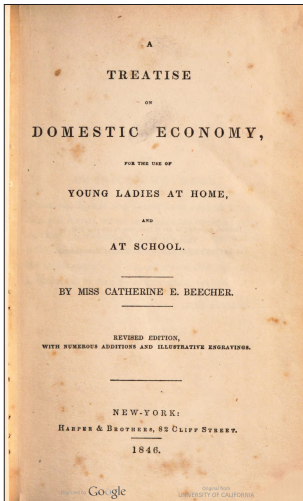
household. With the birth of the first modern nations in Europe, these books were decisive in the development of a *raison d'État* or reason of state, a form of government that understood its territory as an expression of the household and its population as the family that had to be taken care of for the flourishing of the whole.

Since the end of the seventeenth century, the French term *mesnagement*, understood as the management or administration of affairs, has frequently intersected with economics. At the same time, the territory and its population were rendered *manageable* through cartography and statistics. In this movement, the territory, nature, and the market were first internalized, i.e., turned into a controllable and standardized field where the new markets can flow. With the popularization of these manuals in the nineteenth century it is the house that is externalized to infuse it with the rationality of that economic flow. In this situation, the recipe is incorporated into a much broader prescriptive language, where infrastructural semiotics codify this new vision and rationality.

An Efficient (Because Predictable) Household

In 1841, the US educator Catharine Beecher published *A Treatise on Domestic Economy*, a direct heir to earlier manuals on domestic economy that intensifies the link between ideology and infrastructural language. Beyond the critical use of *reason* that had characterized efforts in the previous century, we witness here the first steps of a positivist and capitalist-inspired *rationality*.

Beecher's manual, which became an undisputed success, is characterized by a modernizing will wrapped in puritanism and a unique form of sexism which while advocating for the education of women justifies, for the new nation's sake, their subjugation to men. In this manual, the economy, in its virtuous capacity to order and optimize, comes to the rescue of so many women lost in disorder, ill health, and ignorance. Convinced that many of society's problems stem from a lack of scientific knowledge in the home, Beecher sought to dignify and enlighten the housewife's work by acknowledging it as a profession. One in which knowledge of chemistry, mathematics, physiology, construction, and agriculture was necessary, without forgetting at any time those Christian teachings that "[refine] the good manners and [preserve] the good temperament of women."



The illustrative engravings of the *Oeconomus prudens et legalis* have been substituted with tables and diagrams that sought to clarify and order the “right way” of doing things.⁸ There is no room for gentle prescriptions, their place being taken by straightforward guidelines whose authority derives from their scientific inspiration. Attention is given to human physiology, the importance of a healthy diet, clothing, cleanliness, punctuality, domestic exercises to keep the body active, good manners, refinement, systems to organize tasks and spaces, the construction of the house, fires and lighting, ironing, or the economy of time and expenses, among many other matters. Special emphasis is placed on women's responsibilities—to the nation, its institutions, and progress in general—no longer the simple result of isolated recipes, but to the delineation of a comprehensive lifestyle drawn in accordance with a puritanical and capitalist ideology that connects the interior of the home with the flow of the market. An exteriorization of the house that completes the interiorization of the environment carried out during the previous two centuries.

The culmination of these changes can be seen in the *Dietary Computer* (1902) by Ellen Richards, another champion of the American home economics movement.⁹ This small pamphlet claims to condense more than two or three hundred cookbooks into sixty pages, “containing tables of food composition, lists of prices, weights, and measures, selected recipes for the slips, [and] directions for using the same.” With this peculiar calculating device, Richards aimed to make it easier for the housewife to compose menus for any time of the year on the basis of the nutritional composition of food and its prices. To do this, she provides a whole series of tables and recipes so that to compose a menu you can look up the foods with the most calories and the lowest price in tables II to IV, then look at the numbers of recipes that contain them and go to table V which lists 129 recipes (all calculated for six people). These tables are accompanied by another one showing measurements, costs, fats, proteins, and calories so that anyone can build balanced menus according to the daily needs of each member of the family, which can be known based on her DIETARY ESTIMATES, BASED ON FOOD AS PURCHASED: Man at hard labor: 150 grams protein, fat 150 grams, carbohydrates 500 grams, 4060 calories; man at light labor: 125 grams protein, fat 125 grams, carbohydrates 400 grams, 3310 calories; woman at light labor: 100 grams protein, fat 100 grams, carbohydrates 320 grams, 2650 calories; child of nine years: 78 grams protein, fat 45 grams, carbohydrates 280 grams, 1890 calories.

⁸ The term “right way” already introduces a path, making explicit the spatial dimension of this infrastructural language.

⁹ Ellen Richards was the first woman to graduate, with a degree in chemistry, from MIT, where she was accepted as a special student. Aware that this was an experiment in women's admission to the university, she volunteered to sweep the lab floor and sew for her professors for the duration of her studies, which, as she wrote, allowed her to appear much more acceptable than if she had been a “radical.”

THE DIETARY COMPUTER.

EXPLANATORY PAMPHLET

THE PAMPHLET CONTAINING

TABLES OF FOOD COMPOSITION,
LISTS OF FOODS, WEIGHTS, AND MEASURES,
SELECTED RECIPES FOR THE SLIPS,
DIRECTIONS FOR USING THE SAME.

BY
ELLEN H. RICHARDS,
Instructor in Sanitary Chemistry, Massachusetts Institute of Technology.

ASSISTED BY
LOUISE HARDING WILLIAMS.

FIRST EDITION,
FIRST THOUSAND.

NEW YORK:
JOHN WILEY & SONS,
LONDON: CHAPMAN & HALL, LIMITED,
1902.

THE DIETARY COMPUTER.

they may to a certain extent replace each other, especially in adult life.

DIETARY ESTIMATES, BASED ON FOOD AS PURCHASED.

Food	Protein	Fat	Carb.	Calories
Meat as sold (lean)	12.5	5.5	0	400
Meat as sold (with fat)	10.0	10.0	0	310
Chicken as sold	18.0	2.0	0	350
Egg as sold	12.5	5.5	0	290

American take far more fat in proportion to carbohydrate than any other nation. They are more active. Whether their activity follows from the use of fat is not known, only suspected. Grass-grains must be made to yield their secrets before this can be determined.

Calorie is a unit measure of heat used to denote the energy-giving power of food.

Table II is a list of the total food values and estimated cost of the recipes given in Table V, arranged in order of food value.

Table III gives the same list arranged in order of cost per 1000 calories.

Table IV gives the same list arranged in order of cost per 100 grams of nitrogenous substance.

In order to plan a dietary of a given composition at a given cost it is necessary to know:

1st. The approximate composition of the food-materials to be used (Table II).

2d. The amount of food materials entering into the composition of each dish. Table V (Recipes). Only in case this is known can the food values be computed for Table II.

3d. In order to know this it is necessary to have:

4d. Definitions and equivalents of weights and measures.

TABLE I. CONSTANTS.

Food	Protein	Fat	Carb.	Calories
Meat as sold (lean)	12.5	5.5	0	400
Meat as sold (with fat)	10.0	10.0	0	310
Chicken as sold	18.0	2.0	0	350
Egg as sold	12.5	5.5	0	290

THE DIETARY COMPUTER.

TABLE II.

DISHES CONTAINING MEAT—IN ORDER OF FOOD VALUE EXPRESSED IN CALORIES.

Name of Dish	No. of Servings	Protein	Fat	Carb.	Calories
Roast beef (Philadelphia)	1	12.5	5.5	0	400
Roast beef (Boston)	1	10.0	10.0	0	310
Roast beef (London)	1	18.0	2.0	0	350
Roast beef (New York)	1	12.5	5.5	0	400
Roast beef (Chicago)	1	10.0	10.0	0	310

COST OF 1000 CALORIES OF FABRICIOUS DISHES.

TABLE III.

DISHES CONTAINING MEAT ARRANGED IN ORDER OF COST OF 1000 CALORIES, SHOWING WITH THE LOWEST COST FOR ONE PERSON 1000 CALORIES PER DAY IN THE USUAL ALLOWANCE.

Name of Dish	Cost per 1000 Cal.
Roast beef (London)	0.15
Roast beef (New York)	0.18
Roast beef (Boston)	0.20
Roast beef (Philadelphia)	0.22
Roast beef (Chicago)	0.25

TABLE V. RECIPES.

Recipe	Protein	Fat	Carb.	Calories
Roast beef (Philadelphia)	12.5	5.5	0	400
Roast beef (Boston)	10.0	10.0	0	310
Roast beef (London)	18.0	2.0	0	350
Roast beef (New York)	12.5	5.5	0	400
Roast beef (Chicago)	10.0	10.0	0	310

RECIPES.

TABLE V.

RECIPES.

NO. 1. SCRAPPLE, PHILADELPHIA STYLE.

Quantities are estimated for six persons.

Ingredients:
Pork head 1 lb.
Corn meal 1 cup
Potatoes 2 lbs.
Onions 2 lbs.
Carrots 2 lbs.

Directions:
Clean the pig's head. Put in a stew-pot with 4 qt. hot water. Let it simmer for 3 hours. Take out the meat and chop it fine. Chop the potatoes, onions, and carrots fine. Mix the meat, potatoes, onions, and carrots with the corn meal. Pack in a loaf and bake for 2 hours.

NO. 2. IRISH STEW WITH DUMPLINGS.

Stew the meat 1 hour, add the vegetables and seasoning; then boil to softness, add the dumplings.

Ingredients:
Potatoes 4 lbs.
Onions 2 lbs.
Carrots 2 lbs.
Beef 1 lb.

NO. 3. VEAL CROQUETTES.

Ingredients:
Veal 1 lb.
Potatoes 2 lbs.
Onions 2 lbs.
Carrots 2 lbs.

THE DIETARY COMPUTER.

NO. 4. SALT PORK IN BATTER.

Cut the pork in thin slices, dip both sides in flour, then in egg, and finally in batter. Fry in a shallow pan of hot fat.

Ingredients:
Pork 1 lb.
Flour 1/2 cup
Eggs 2
Butter 2 tbs.

Directions:
Cut the pork in thin slices. Dip both sides in flour, then in egg, and finally in batter. Fry in a shallow pan of hot fat.

Ingredients:
Pork 1 lb.
Flour 1/2 cup
Eggs 2
Butter 2 tbs.

Directions:
Cut the pork in thin slices. Dip both sides in flour, then in egg, and finally in batter. Fry in a shallow pan of hot fat.

THE DIETARY COMPUTER.

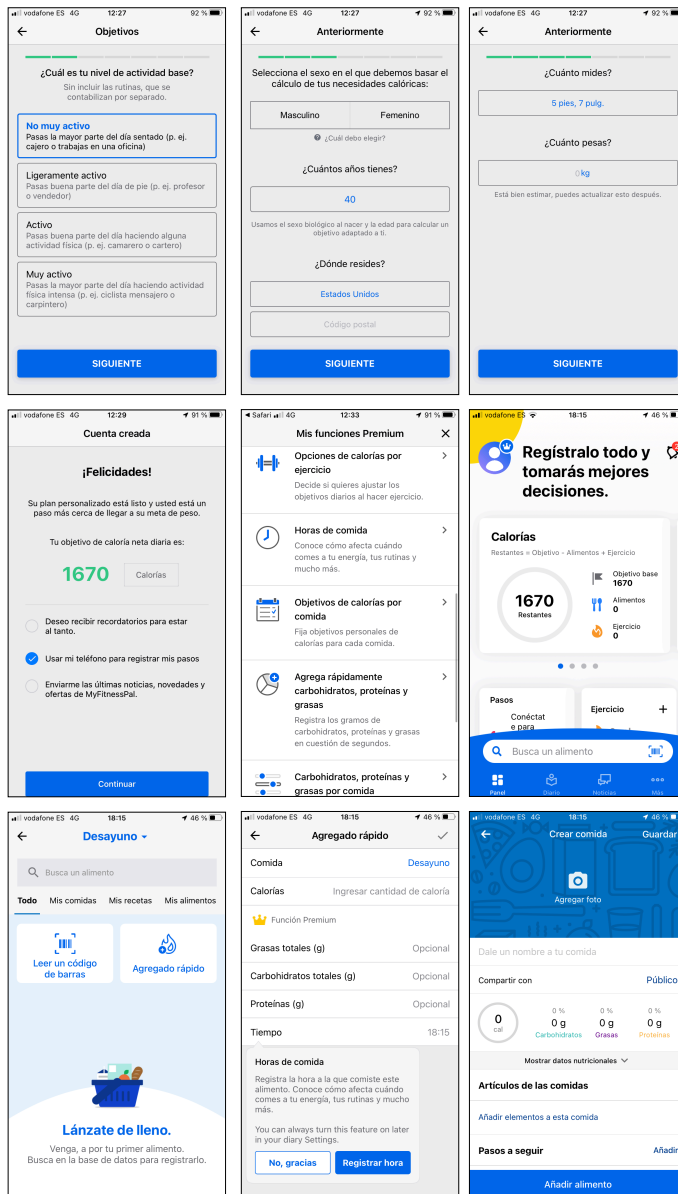
TABLE VII.

APPROXIMATE COMPOSITION OF 1000 CALORIES OF SOME COMMON FOOD MATERIALS.

Food	Protein	Fat	Carb.	Calories
Meat as sold (lean)	12.5	5.5	0	400
Meat as sold (with fat)	10.0	10.0	0	310
Chicken as sold	18.0	2.0	0	350
Egg as sold	12.5	5.5	0	290

20 *The Dietary Computer*, by Ellen H. Richards, New York, London, 1902. Digitized by Google, available at <https://archive.org/embed/dietarycomputer02willgoog>

The Dietary Computer can be read as the source code for the food tracking apps flooding the market today, which like MyFitnessPal (US, 2005, private company) promise us: "record everything, and you will take better decisions". Something which is often true, but needs to be balanced given the growing concern regarding the connections between this intense self-tracking to health anxiety and cyberchondria. This digitization was advanced by chemists and physiologists at the end of the nineteenth century, they provided the contents of many of these tables laying the foundations for optimizing digestion (and life in general).



21 Screenshots of the iOS app, MyFitnessPal, named one of the top 10 calorie-counting apps in 2023 by Forbes magazine (<https://www.myfitnesspal.com/>)

Although charts and databases (often in the form of lists) had been a key part of the production of food for ages, they were now applied in a very disciplined and comprehensive manner to every step of digestion, establishing the basis of automation, environmentality and the appearance of more advanced data-based methods by the end of the twentieth century. Richards's measurement equivalency charts have become tabs that allow us to easily switch between inches and centimetres, grams and ounces. Customizing menus, exercise charts, and other tips requires no more effort than providing our details and agreeing to the terms of service. From there, an avalanche of nudges in the form of notifications and signals on our personal devices will set us on the "right way" by informing it as a field of possibility around us. Black boxed in their proprietary codes, these right ways are

usually built out of statistical averages not clinical attention (something that new AI models lay the groundwork to). As a result, it will naturally help people, but like an updated manifold of Richards's dietary estimates, it will also risk sustaining ideological blind spots¹⁰ and necessarily erase a large spectrum of nutritional and physiological diversity.

Betty Crocker

Faced with the slow implementation of their reforms and the perceived reluctance of many women to incorporate scientific principles into their cooking and housekeeping, Beecher and Richards launched the Lake Placid Conferences at the beginning of the twentieth century. It was there that the principles of home economics were defined, understood as a field of scientific knowledge to be deployed in an ambitious educational program, from the nursery school all the way through to the university and postgraduate degrees. The chemist Isabel Bevier was one of the many attendees and the first who was able to establish an academic program based on its principles. She did so with enormous success at the University of Illinois, where she was hired in 1900 to develop a new department of household science. Within five years, Bevier's program had grown from twenty to eighty students and included courses in botany, bacteriology, zoology, physiology, chemistry, physics, mathematics, design, physical education, architecture and decoration. The success of the programme was such that the department expanded its facilities, building an experimental house on campus where its students interned, and a refurbished train carriage to demonstrate the use of new tools and furniture to women from outside the campus. As manuals multiplied with protocols, rules, tables, and various *computers*, Bevier realized that to make this infrastructural language more effective, training women in the actual *performance* of the code was necessary. These training facilities operated as experimental signal ecologies, converting these languages onto environmental and somatic semiotics, which made them easier to replicate and expand. Before the First World War, the United States had more than 250 universities offering programs in Home Economics and it was beginning to be incorporated into the curricula of schools and high-schools.

Far from creating a stand-alone cooking school, at the University of Illinois food was considered closer to the field of chemistry, laying the foundations for the future discipline of food science. This, along the emphasis on efficiency and new techniques helps explain the close relationship between the food industry and home economics. Not only would many of the women trained in these programs end up working in the industry, but the industry itself would rely on their pedagogical work to standardize new practices, foods, and utensils. In fact, the industry would create the best-known

¹⁰ Richards's dietary estimates were based on those elaborated by chemist Wilbur Olin Atwater at the turn of the twentieth century. Historian Laura Shapiro explains how Atwater increased the amounts suggested by existing German and England standard dietaries, recommending less carbohydrates and rising the quantities of protein and fat because, in his own words "We live more intensely, work harder, need more food, and have more money to buy it, [than our European counterparts]. The better wages of the American workingman as compared with the European, the larger amount of work he turns off in a day or a year, and his more nutritious food are, I believe, inseparably connected."

representative of the home economics movement, the ideal woman that its protocols had modelled: Betty Crocker¹¹.

Despite being named in 1945 the second most famous woman in the United States (second only to Eleanor Roosevelt), Betty Crocker was a fictional character. She was invented in the 1920s by the advertising department at General Mills (US, 1856, NYSE: GIS: 79,60 USD +0,69 [0,87 %] ↑) in response to the letters it received from consumers with questions about cooking and the use of their products. Knowing that such answers would be better received if they came from a woman, General Mills ad executive Samuel Gale invented Betty Crocker, who was appointed Head of Correspondence with a supporting cast in the shadow comprised of a long list of women known as the “crockettes,” most of them graduates in home economics.

Meet Betty Crocker, Home Economist
...all 21 of her!

No wonder Betty Crocker of General Mills seems a very real person to so many millions of American women. No wonder they regard her as a friend and accept her as an authority on food, appliances and homemaking. For Betty Crocker is as real as 21 graduate home economists can make her—21 women whose knowledge and warmth and broad experience combine to give Betty Crocker a unique personality all her own.

These 21 home economists are Betty Crocker. In her name they bring to home-makers everywhere the benefits of General Mills' research, products control, product testing and practical, helpful service for the home. Over Betty Crocker's signature they answer more than 20,000 letters a month, offering practical advice and sharing hard-won knowledge to help solve the everyday problems of women in the home. In five Betty Crocker kitchens they work and test to develop new recipes, services for appliances, quicker methods, easier ways, more efficient planning for many phases of homemaking.

That's why Betty Crocker is more than a name, more than a symbol: she is the combined training and character and undistinguished of these 21 women—graduates of 18 colleges and universities with practical experience in every field of home economics.

Would you like to know more about Betty Crocker? She's ready to answer your questions—all 21 of her!

** We show you—the home economics positions in General Mills, the girls in them, their college or university and type of previous experience.*

This advertisement appeared in the October, 1948 issue of "Journal of Home Economics."

Director, Home Service—JANET KELLEY—Miss. State Coll.—teaching, home econ. appts. dir. test kit, dir. home economics dept.

Supv. Kitchen Operations, BAKING AND BREADS—MARGARET WHEAT—Miss. State Coll.—teaching, active food service, restaurant food service.

Experiments, Training—EUGENE ANTHONY—Univ. of Minn.—Shore Inst., Dir. of Chicago—home ec. and science teacher, home ec. supervisor.

General Training—BERNADETT LANSBERG—Iowa State Coll.—teaching, social service worker, P.M.C.

Product Control—EVELYN WHEAT—Iowa State Coll.—teaching, university food service.

Asst. in Experimental and Product Control, Training—LORRAINE KILGREN—Missouri College.

Apppliance Training—EMMETT LEO THOMAS—Missouri College—teaching, active food service, restaurant food service.

Trng. and Guest Luncheon—MYRA JOHNSON—Univ. of Illinois—institutional management.

Supv. Product Control, MARGARET SPADER—University of Minnesota—teaching, food company, from home administration.

Product Control on Cereals, Soup, Pa. Mince, JEAN HILL—University of Minnesota—teaching, home ec.

Product Control on Flour, GLADIS SCHMIDT—St. Louis Institute—teaching, training food service, restaurant.

Prod. Control—Eug. Minn. MARTEL MERTIN—Univ. of Neb.—Iowa State Coll., Columbia—teaching, test, test kitchen, in-warehouse work.

Product Control on Meat, RUTH KLASSE—Cornell University—food company, magazine test kitchen, home market.

Product Control on Flour, MARGARET WHEAT—Iowa State Coll.—teaching, distillation, home ec.

Product Control on Apple, MARGARET WHEAT—Iowa State Coll.—teaching, distillation, home ec.

Product Control on Apples, VIRGINIA VAN NOSTRAND—Iowa State Coll.—teaching, advertising, W.M.E.

Apppliance Correspondent, HELEN SACCHARIDIS—St. Lawrence College.

Supv. Editorial Division, HELEN HALBERT—Iowa State Coll., Columbia—teaching, press, and food appts. test kit, map edit. staff.

Creative Writing, RUTH G. ANDERSON—University of Minnesota—teaching.

Customer Recipe Testing, MARLENE—Kansas State College—marketing/advertising agency, home ec.

In addition there are 26 girls in the Home Service Department—many trained in special fields—to help carry on the work of Betty Crocker. And there are 10 graduate home economists in other departments of General Mills.

Yours sincerely,
Betty Crocker
OF GENERAL MILLS

Superior Customer Contacts, JEANETTE CAMPBELL—Ohio Univ.—public utility home service dir., newspaper food editor, radio.

22 A 1948 General Mills ad featuring 21 women of the Home Service Department behind Betty Crocker. General Mills.

Over the course of several decades, one of Betty's main functions was to create a bridge between the old habits of society and the new foods and customs being developed by the industry. She did so by building on the infrastructural languages created by home economics which were to be greatly optimized by the industry and the growing fields of psychology and advertising. The moral principles of thrift and nationalism present in Beecher were replaced by a new ideal of consumption upheld by

¹¹ The apparent contradiction between employing graduate women and advertising a patriarchal stay-at-home model like Betty Crocker is easily explained. The women that worked in the industry often did it in the lower ranks, e.g. creating the recipes that went along the baking mixes, not as chemists or executives. Home economics didn't advocate for women's rights to work outside the home, it sought to optimize housekeeping. It was not about upsetting the status quo, just making it more efficient in economical terms.

a food industry that was constructed, after the war, as a new patriotic institution that was showcased around the world and would soon export its discoveries and feats.

Capitalism had run its course, and with her famous baking mix, Betty Crocker perfected the recipe as contract, claiming to “guarantee a perfect cake, every time you bake—cake after cake after cake.”

A Model That Performs Us

In 1975, the artist Martha Rosler created “Semiotics of the Kitchen”, a six-minute black and white video in which we see her in a fixed shot talking through a kitchen glossary that takes her from A (apron) to Z, which she culminates with a knife movement making the “Z” of “El Zorro.” In between, she uses bowls, mixers, and frying pans in an absurd and violent way, parodying and deviating from the infrastructural uses with which advertising, the food industry, and home economics, among other actors, were organizing women’s behaviour. Shortly before the end of the video, Rosler shrugs her shoulders. It is a fleeting gesture that can go unnoticed but strongly underlines the absurdity of the whole semiotic system that defined and shaped women, meticulously designing around them the sphere of life they should enjoy and, from there, the behaviour they ought to have. A language constructed with the support of a myriad of publicists, food industry executives or graduates in home economics to do the talking for many women, transforming them into yet another sign or semiotic source to release in the market circuit—“a system of harnessed subjectivity,” as Rosler herself would describe it.

The diagrams, tables, rules, norms, recipes, and instructions of the home economics manuals trained women in this semiotics, but as both Bevier and Rosler recognized, it was in the act of performing these protocols that they became inscribed in the body, its routines and habits. The code was becoming living flesh in the house, just as the movements of the worker in the Ford factory were being inscribed in his musculature. One of the fundamental instruments that enable us to understand Betty Crocker’s success in the radical transformation of food culture were the Betty Crocker Kitchens. Initially built to create new recipes, by 1946 they had become a public space where the new way of eating (and behaving around food) was showcased to men and women from all over the country, welcomed and trained in the use of General Mills products. Tens of thousands of people flocked to visit them each year until their closure to the public in 1985. The kitchen had become a key infrastructure to environmentally inform a new way of life. This was clearly shown in the 1959 American National Exhibition held at Moscow. There, then US vice-president Richard Nixon and USSR chairman of the Council of Ministers Nikita Khrushchev famously confronted their views on the advantages and disadvantages of the capitalist system and lifestyle in what came to be known as the Kitchen debates. A Betty Crocker kitchen was indeed present in Moscow, although it was not the one in the famous photograph depicting the heated exchange.

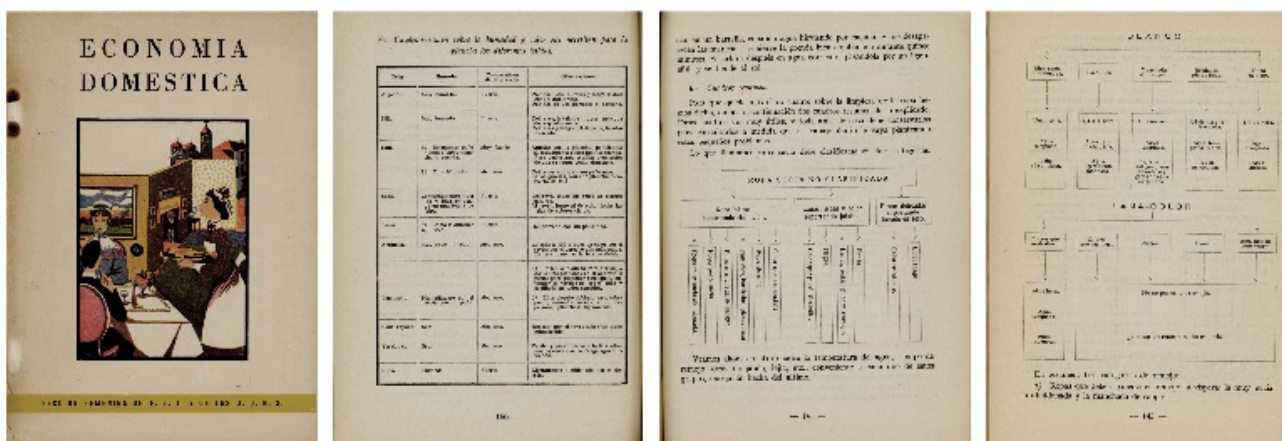


23 Martha Rosler, *Semiotics of the Kitchen*, 1975.

During the nineteenth century, Europe had its own developments in the field of home economics. In the face of the changes brought about by the industrial revolution and urban growth, women were seen by progressive associations and governments as an essential agent in the adaptation of society, playing a moralizing and hygienic role. In Spain, the influence of these initiatives, especially after the first schools had opened in France, Belgium, Switzerland or Denmark, led in 1911 to the creation of the Escuela del Hogar y Profesional de la Mujer (Women's Home and Professional School) in Madrid. There, women were trained in housekeeping while learning a trade. In contrast to the perfect symbiosis between religion and home economics in the United States, in Spain

conservative sectors and the Catholic Church scorned the initiative, calling it a “monstrosity” and pointing out that it was an intolerable intrusion into the home that called into question the institution of the family.¹²

This resistance disappeared with Franco and the arrival of the Sección Femenina (Women's Section). In 1939, the women's branch of the Spanish Falange¹³ was designated by the dictatorship as responsible for the political and social education of Spanish women in accordance with the principles of the new regime, as well as for their housekeeping training and physical education. Home schools multiplied and new manuals filled with tips, recipes, diagrams, protocols, and the tables typical of home economics were published. In their 1955 *Manual para la Economía Doméstica* (Manual for Home Economics), we find precise and exhaustive instructions on the most diverse subjects like a dwelling's orientation, ventilation and capacity, housekeeping utensils, lighting, heating, cleaning, household linens, budgeting, table dressing or domestic medicine¹⁴.



24 Pages taken from the *Economía Doméstica* (Domestic Economy) manual, by the Sección Femenina de F.E.T. y de las J.O.N.S. (Women's Section of F.E.T. and J.O.N.S.), Madrid, 1955.

These manuals provided guidelines for practical teaching, which was what really codified the principles of the regime in the body of its trainees. Back then, the kitchens of the Escuelas Hogar (Home Schools) where good housekeeping was taught all around the country were just as important as those at the School of Las Navas Castle where future teachers and instructors of the Section were taught, or the kitchens which travelled all around Spain for nearly thirty years in the caravans

¹² To which its promoter and Minister of Public Instruction, Amalio Gimeno, replied in the Congress of Deputies: “Doesn't your honor know that this is an educational body that has multiplied in all countries, and that if it is needed in more cultured nations, there is greater need for its creation and support in ours, where women have to struggle with enormous difficulties in the course of an existence that seems to pursue no other goal than that of finding a fiancée and a husband?”

¹³ Falange Española was a fascist political party founded in Spain in 1933. It was inspired by Mussolini's fascism and was greatly influenced by the Spanish Catholic Church. During the period of the Spanish second Republic, Falange Española was a key agent of the extreme right and conservative sectors as they tried to unseat the new regime, efforts which concluded with the 1936 military coup that led to the Spanish Civil War and Francisco Franco's dictatorship.

¹⁴ Sección Femenina also published a *Manual de Cocina: Recetario* (Cooking Manual: Recipe book, 1950), which even today, after recovering the authorship of its original creator, Ana María Herrera, is successfully published with “daily minutes of lunches and dinners for each season,” calculated, like Richards's computer, for six people.

known as *Cátedras Ambulantes* (Travelling Chairs). This initiative sought to bring basic education to the rural population. Each chair consisted of a series of cars and trailers with a kitchen, a classroom, a small library as well as living quarters for the instructors. The first of these caravans, appropriately named “Francisco Franco,” began its work in 1946 and its success led to the creation of new chairs that began traveling all around the country. The kitchen car had “all the elements necessary to do its job”, at least that’s what the 1958 film documentary produced by NO-DO stated, adding: “Everything is new, shiny and clean. And it perfectly solves the difficulties involved in the mobile installation. [The lessons] will enable women to achieve greater yield from their products within their own home and at the same time introduce appetizing culinary variations in both stews and pastries.”



25 *Cátedras Ambulantes* (Travelling Chairs). Images from the magazine *Revista Imágenes del NODO*, corresponding to January 1st, 1958. Available on the RTVE archive: <https://www.rtve.es/play/videos/revista-imagenes/catedras-ambulantes/2867240/>

It is undeniable that the creation of a “harnessed subjectivity” as mentioned by Rosler generates resistance. The reduction of a field of possibilities into one single “right way”, be that in cooking, housekeeping, or any other practice which is not an exact science, means the delineation of a limitation, the erasure of virtuality and the enforcement of a previously decided behaviour. And so, we see how Beecher described with dismay women's rejection of her methods, while the Sección Femenina success in its shaping of Spanish womanhood for three decades can only be explained by the rigours of the dictatorship. This direction depends on a spatial construction which literally involves the creation of an enactment vector, designed by means of a medium loaded with signals capable of orienting and mobilizing, conditioning and positioning, by eliminating other movement possibilities from then on discarded as mere noise.

Similar spatial concerns can be seen in Alexander Klein's *Functional House for a Frictionless Living* (1928), Christine Frederick's diagrams in *The New Housekeeping* (1913) or Paulette Bernège in “L'Installation de La Cuisine” (1929). By the mid twentieth century though, we begin to see a transformation in this performative semiotics, parallel to a move from static representations of space to environmental approaches. Although we witness the same ideological coding, this code is now inscribed in an active environment, an agent that moves and disposes. In contrast to previous flow diagrams, where function is flattened out in a plan, a new environmental attention surrounding not function, but behaviour comes forth, as in the study *Measuring Space and Motion* (1944) by Jane Callaghan and Catherine Palmer. This work speaks of an architecture of the medium as a membrane linked to the scope of the body's action, therefore to that body's spatial agency. Through a volumetric photographic study, the researchers draw out the space a body needs in order to carry out basic domestic tasks (including a mother dressing a child and a mother combing a child's hair). The volume that appears might invite a speculative inversion. What if that delineation is not born *out* of the body's agency but points to the degrees of freedom that the medium must allow *in* to provide a gentle and therefore imperceptible support for that task? The medium can act as an efficient though invisible agent to train movements just like the vibrations of Amazon's wristbands or the alerts of our nutrition app reminding us to walk.

The Recipe Becomes a Medium

Although the term “recipe” continued to be used, in the nineteenth and twentieth centuries the term *formula* also began to be used in cookbooks and other specialized literature. From the eighteenth century onwards, it was used in the fields of medicine, mathematics, and chemistry. In Latin, *formula* is a diminutive of form, and is understood as a rule or “instrument for forming,” which the writer Thomas Carlyle defined in 1837 as a “rule followed *slavishly* without understanding it.”

One of the first texts in which formula was applied to cookery was the *Futurist Kitchen Manifesto* (1930), written by Filippo Tommaso Marinetti. A text where “chemistry was invited to the duty of giving the body the necessary calories through free nutritional equivalents of powdered or pill state, albuminous compounds, synthetic fats and vitamins,” and where sensory over-stimulation through sight, electricity or perfumes was praised, creating “simultaneous and changing mouthfuls containing ten, twenty flavours that can be tasted in a few moments.” This requires the help of machines, be it ozonators to perfume food, ultraviolet lamps to activate substances and electrolyzers to break them down, or colloidal mills, distillation apparatus, centrifugal autoclaves or dialyzers to break down the “boredom” of traditional food.

Marinetti played with the technical developments that the food industry was already implementing at the time. An industry where formulas were becoming an essential component of its automated processes, as shown by one of the most famous formulas of the industry: Coca-Cola’s (US, 1892, 61,85 USD -0,010 [0,016 %] ↓). This carbonated drink was the invention of chemist John Pemberton, whose blend of essential oils known as “Merchandise 7X” (80 orange oil; 40 cinnamon oil; 120 lemon oil; 20 coriander oil; 40 nutmeg oil; 40 neroli oil; 1/4 alcohol) constitutes less than 1 percent of a drink that has remained the same since 1886, or so says the mythology built by the brand, and whose formula is known, again according to legend, by only two company executives.

The precision that characterizes the formula or industrial recipe makes it easier to codify it along factory chains where the cook is a robotic system which controls all factors, responsible for reading and interpreting by itself all involved signals with no room for ambiguity or uncertainty ([else](#)). The unexpected is deemed an error, often resulting in waste which needs to be eradicated. Several companies like Nestlé, Pepsico (US, 1898, NASDAQ: PEP: 180,83 USD +0,16 [0,089 %] ↑) or Barilla (Italy, 1877, private company) are applying artificial intelligence within digital twin technologies to address this. One of the companies they work with is Seebo (Israel, 2015, private company). On their website we read that their service “is designed to predict and prevent process-based production losses in manufacturing, using Process-Based Artificial Intelligence™”. A digital twin creates a virtual version of a company’s production line, an instrument which is also becoming an industry standard to assure [traceability](#). This double allows it to automatically detect losses and identify its causes, leading to its global optimization while also creating a system of alerts

that permits the anticipation of errors, thus avoiding losses before they happen. Prediction becomes the new adaptive way of setting the right course.

In restaurant chains where a recipe must be able to be produced exactly the same in each of their locations, this automation needs to be encoded otherwise. Many franchisees offer minutely defined recipe books, machines, raw materials, and preparations in order to replicate the “right medium” in which to reproduce, like Betty Crocker with her pies, endless repetitions of the same dish. Through different semiotics (layouts, nudges, manuals) the medium becomes the cooking agent, carrying out the steps and moving the cook who becomes a mobile part.

The film *The Founder* (2016) describes the moment when the founders of McDonald’s, Dick and Mac McDonald, designed their Speedee Service System, a form of Taylorization of the kitchen, where each worker is assigned a specific role depending on the machinery and the outputs required. In two and a half minutes we witness from a top view the prototyping of a *medium-recipe*. First, they drew a 1:1 scale plan of their kitchen on a tennis court, brought in their workers and asked them to make imaginary hamburgers, going through all the necessary motions. Meanwhile, Dick and Mac watch every step, visualizing new choreographies. After six hours and several versions, “a symphony of efficiency, not a waste of motion” emerges. Today, McDonald’s kitchens operate with similar systems, where the medium builds the movements that execute the recipe, through machine layouts, protocols or even small nudges in the form of checklists at each step: *Maintaining Target Toast*: 1. Maintain proper inventory / order; 2. Use oldest first - No out-of-code buns; 3. Store buns properly to prevent staling; 4. Keep buns covered to protect from air; 5. Maintain equipment. Check toaster platen or belts daily for wear and / or buildup. Use proper compression / temperature; 6. Taste to assure caramelized flavor, taken from a set of instructions at a McDonalds kitchen. The kitchens at some of the most sophisticated restaurants also organize the space to carry out their tasks in the most efficient way. There’s one relevant difference though, the demand for an interpretative capacity in its workers, which points to a creative medium that manages to balance efficient circuits with the presence of openness, a right way which does not erase virtuality.

YouTube Recipes

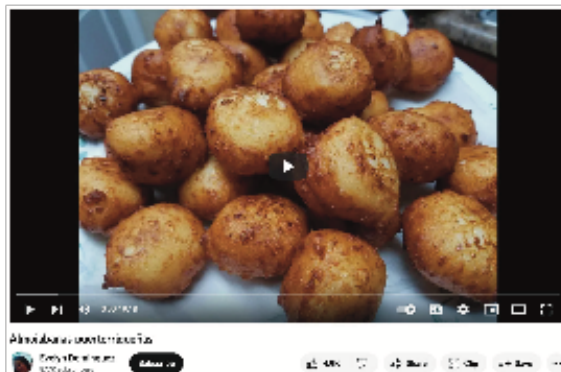
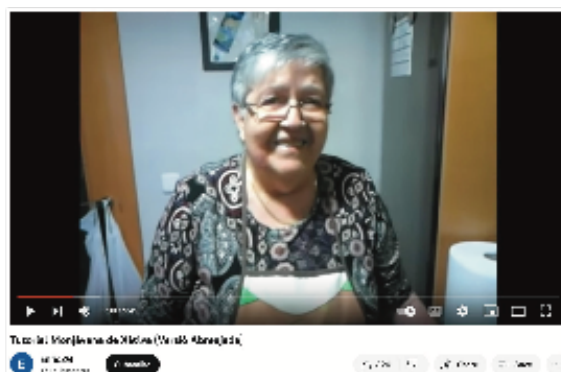
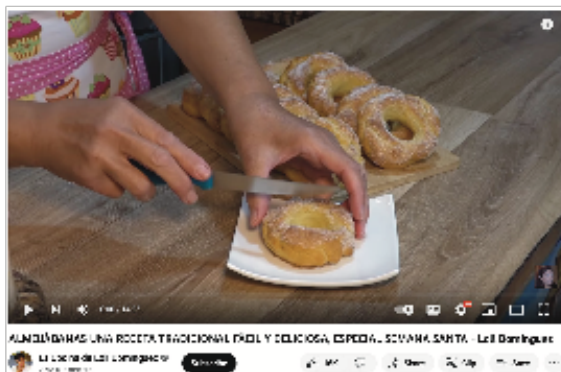
We find the term *almojábana* in humanist Antonio de Nebrija’s Spanish-Latin dictionary of 1495. It is also present in the first monolingual dictionary known as the *Treasure of Covarrubias*, from 1611, where it is defined as “certain flat cake (torta) that is kneaded with cheese and other things”. Both sources are recovered in the *Diccionario de Autoridades* (Dictionary of Authorities), the first dictionary published by the Real Academia Española de la Lengua, the official body established in 1713 to fix and regulate the use of the Spanish language whose definition has remained more or less stable (in the dictionary) to this day. Nonetheless, today not many Spaniards know what an *almojábana* is, even in those regions where it was popular in the past.

On the other hand, when I shared this research with a Colombian friend, his face lit up and he explained to me that almojábanas are prominent in his country. Less sweet than its Andalusian version, it works as a type of breakfast or afternoon snack bread or bun, which is taken with coffee or chocolate. Although a complete history of this transatlantic journey is lacking, it does seem certain that almojábanas arrived from Spain with colonization and adapted to the new environment, customs and available ingredients, substituting wheat flour for corn flour and changing the original frying for baking. The journey did not stop there though, and today we can find these Colombian almojábanas in the streets of many Spanish cities thanks to Colombian restaurants and bakeries as La Pereirana, in Madrid, where its owner clarifies, even before being asked if his almojábanas are artisanal, “I do not use those baking mixes”.

A YouTube search for “almojábanas recipes” is an unbeatable way to understand the transformation of those initial recipes with which we started this section. This kind of evolution is based on a recipe interpretation as open prescription, where perfection is not the erasure of uncertainty as happened in Crocker’s “cake after cake after cake” or the necessary industrial precision to ensure food safety, but simply what’s actually there, present, real, as Spinoza stated. The cook introduces variants, sometimes through error and sometimes through invention or limited means, keeping the dish alive, able to adapt due to its ability to interpret one way or another. In Spain, the importance of this openness in the adaptation and survival of a recipe has been amply shown in the documentary work of the ethnographic filmmaker Eugenio Monesma whose series “Los fogones tradicionales” (Traditional stoves), has followed for almost two decades the adaptive transmission of traditional recipes between families and small communities.

The “Recetas de almojábanas tradicionales de Benejúzar” (7'02'' / 26,473 views / Nov 27, 2019 / water, oil, flour, eggs, honey) shows a traditional recipe from the Vega Baja del Segura, in Alicante, without cheese and in the form of doughnuts; similar are the “ALMOJÁBANAS UNA RECETA TRADICIONAL FÁCIL Y DELICIOSA, ESPECIAL SEMANA SANTA - Loli Domínguez” (351,877 views / Mar 24, 2022 / water, oil, flour, eggs, honey), where honey is replaced by syrup, or the “Almojábanas de Villastar” (3'54'' / 430 views / Aug 30, 2021 / water, oil, flour, egg), in Teruel, where they are known as *rosquillas tontas* (dumb ring-shaped pastry). There are also numerous videos dedicated to the *monjàvena*, *almoixàvena*, or *monjavina*, local variations on the almojábana from Xàtiva, Valencia. They have almost the same ingredients as the typical *rosquillas* of Alicante and Murcia, but the ring-like shape becomes that of a *coca*, a thin and extended bun. They are also sprinkled with cinnamon instead of being covered with honey. We see it in “Tutorial Monjàvena de Xàtiva (Versió Abreujada)” (9'45'' / 20,587 views / Apr 12, 2015 / butter, water, flour, eggs, sugar, cinnamon and salt), where a home video shows the hands of an old woman diligently preparing the recipe. Beyond YouTube, we also find the almojábana from La Gomera, where the *Diccionario histórico del español de Canarias* also mentions it as *almoabana*, describing it as a typical sweet for carnival days, and

whose recipe is the closest in Spain to the original recipe (water, oil, salt, flour, yeast, fresh goat's cheese, eggs, cinnamon).



27 YouTube search for "receta almójanas".

Most of the videos are for Colombian almojábanas, such as “Receta Para Almojábanas Colombianas - Cómo Hacer Almojábanas - Sweet y Salado” (3'38'' / 1,947,200 views / Jan 28, 2015 / maize flour, sugar, yeast, salt, curd or farmer's cheese, egg, milk), as well as for some other American variants such as the “Almojábanas puertorriqueñas” (9'18'' / 126,111 views / Jun 16, 2016 / milk, rice flour, salted butter, sugar, yeast, cheese, egg, oil) by Evelyn Domínguez, where the sound of frying intermingles with the domestic world around her. Colombian almojábanas are also the most abundant on TikTok. In all these videos we find a new form of recipe transmission where videos recorded by amateurs without the visual pyrotechnics of cookery programmes globalize and localize precise knowledge, currents, and variants all at the same time. These videos invite reproduction and adaptation, with suggestions for changes and the lack of precise measurements being a common trait among them: “whatever the dough will accept” or varying the egg until you get “a texture like this”.

IV. DESIGNS

Carpanta's sense of smell was sharp, to the point of becoming a compass, for the simple reason that he was hungry. When humans are hungry, their CB1 cannabinoid receptors are activated, which in turn awakens the olfactory circuit in our brain, making us more sensitive to olfactory signals from our environment (even though we might not be necessarily aware of it). Visual stimuli are also relevant. When faced with images of large quantities of food, the behavioural control centres and other areas of the brain related to information processing are blocked, making us less able to rationally measure intake. At the same time, our gaze is drawn towards foods with high caloric density because the sight of them more intensely activates the reward centres of the brain. It may be that the trichromatic vision possessed by primates was an adaptation to help find energy-rich fruits (which are usually red) among the undergrowth.

Environmental signals guiding our hungry brain are in perpetual exchange with those released within our bodies to activate the appetite or communicate a feeling of satiety, lowering the level of perceptual alertness and modulating the scope of our dynamic surrounding world. As we ingest food, the sharpness of our sense of smell and taste decreases, while other signals, such as an increase in blood glucose, distension of the stomach or the inhibition and release of hormones and peptides, reduce the craving to eat.

These complex signal ecologies are the subject of analysis and design in food industry laboratories and food technology companies. The inclusion of additives is not used only to preserve food or its flavours; starches or gelling agents are often used to make food more appealing, and sometimes even highly addictive.

Flavouring

According to EU regulation, flavours are substances not intended to be consumed as such, but used to add or modify the smell or taste of a food. The European Union has an official list of authorized flavouring substances that are considered safe for use, and all flavours used in food must follow the current legislation (Regulation (EC) No. 1331/2008; Regulation (EU) No. 234/2011; Regulation (EC) No. 1334/2008; Regulation (EU) No. 873/2012; Regulation (EC) No. 2232/96; Regulation (EC) No. 2065/2003; and Implementing Regulation (EU) No. 1321/2013), as well as being approved by the EFSA (European Food Security Authority)¹⁵ an agency based in Parma, which was founded in 2002 to provide impartial scientific advice to EU and national food safety authorities and to communicate risks and alerts in the food chain.

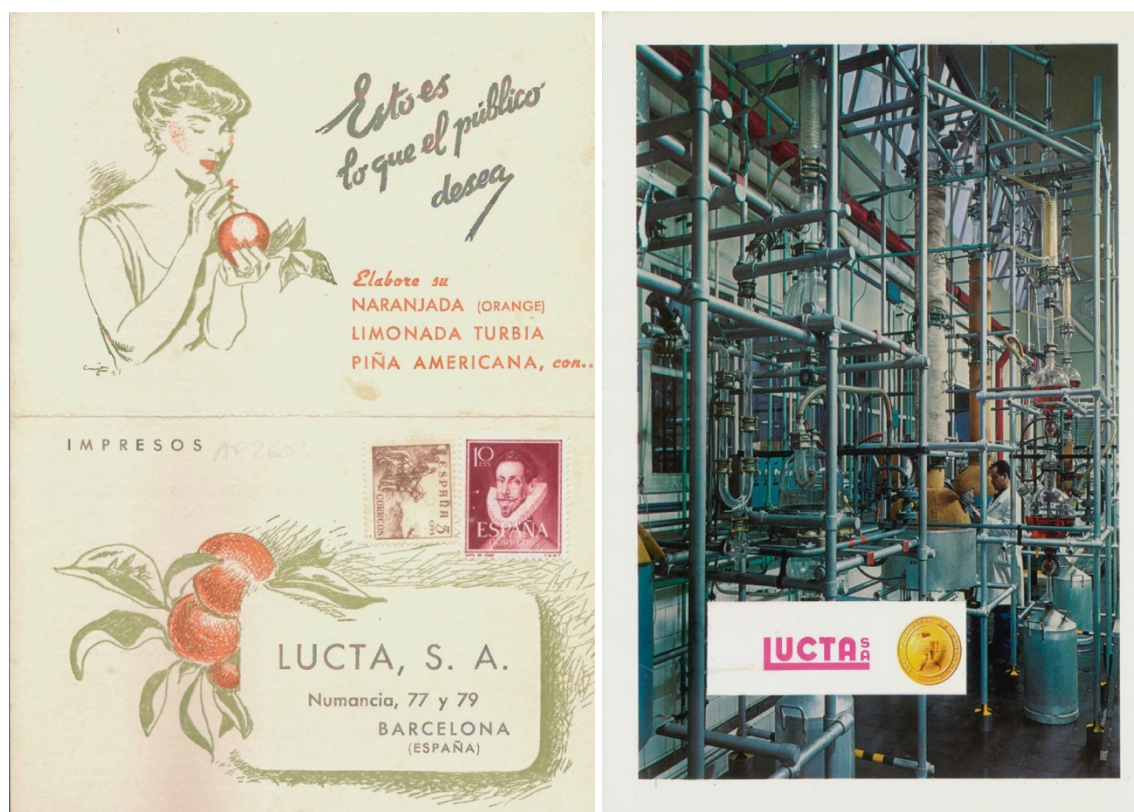
¹⁵ There are also a number of flavors and ingredients with flavoring properties that require neither evaluation nor authorization.

EUROPEAN UNION LIST OF FLAVOURINGS AND SOURCE MATERIALS		EUROPEAN UNION LIST OF FLAVOURINGS AND SOURCE MATERIALS		EUROPEAN UNION LIST OF FLAVOURINGS AND SOURCE MATERIALS		EUROPEAN UNION LIST OF FLAVOURINGS AND SOURCE MATERIALS		EUROPEAN UNION LIST OF FLAVOURINGS AND SOURCE MATERIALS		EUROPEAN UNION LIST OF FLAVOURINGS AND SOURCE MATERIALS	
No.	Name	EC No.	Source material	No.	Name	EC No.	Source material	No.	Name	EC No.	Source material
1	1,2-DIACETYL	24901	Acetyl	1	1,2-DIACETYL	24901	Acetyl	1	1,2-DIACETYL	24901	Acetyl
2	1,3-DIACETYL	24902	Acetyl	2	1,3-DIACETYL	24902	Acetyl	2	1,3-DIACETYL	24902	Acetyl
3	1,4-DIACETYL	24903	Acetyl	3	1,4-DIACETYL	24903	Acetyl	3	1,4-DIACETYL	24903	Acetyl
4	1,5-DIACETYL	24904	Acetyl	4	1,5-DIACETYL	24904	Acetyl	4	1,5-DIACETYL	24904	Acetyl
5	1,6-DIACETYL	24905	Acetyl	5	1,6-DIACETYL	24905	Acetyl	5	1,6-DIACETYL	24905	Acetyl
6	1,7-DIACETYL	24906	Acetyl	6	1,7-DIACETYL	24906	Acetyl	6	1,7-DIACETYL	24906	Acetyl
7	1,8-DIACETYL	24907	Acetyl	7	1,8-DIACETYL	24907	Acetyl	7	1,8-DIACETYL	24907	Acetyl
8	1,9-DIACETYL	24908	Acetyl	8	1,9-DIACETYL	24908	Acetyl	8	1,9-DIACETYL	24908	Acetyl
9	1,10-DIACETYL	24909	Acetyl	9	1,10-DIACETYL	24909	Acetyl	9	1,10-DIACETYL	24909	Acetyl
10	1,11-DIACETYL	24910	Acetyl	10	1,11-DIACETYL	24910	Acetyl	10	1,11-DIACETYL	24910	Acetyl
11	1,12-DIACETYL	24911	Acetyl	11	1,12-DIACETYL	24911	Acetyl	11	1,12-DIACETYL	24911	Acetyl
12	1,13-DIACETYL	24912	Acetyl	12	1,13-DIACETYL	24912	Acetyl	12	1,13-DIACETYL	24912	Acetyl
13	1,14-DIACETYL	24913	Acetyl	13	1,14-DIACETYL	24913	Acetyl	13	1,14-DIACETYL	24913	Acetyl
14	1,15-DIACETYL	24914	Acetyl	14	1,15-DIACETYL	24914	Acetyl	14	1,15-DIACETYL	24914	Acetyl
15	1,16-DIACETYL	24915	Acetyl	15	1,16-DIACETYL	24915	Acetyl	15	1,16-DIACETYL	24915	Acetyl
16	1,17-DIACETYL	24916	Acetyl	16	1,17-DIACETYL	24916	Acetyl	16	1,17-DIACETYL	24916	Acetyl
17	1,18-DIACETYL	24917	Acetyl	17	1,18-DIACETYL	24917	Acetyl	17	1,18-DIACETYL	24917	Acetyl
18	1,19-DIACETYL	24918	Acetyl	18	1,19-DIACETYL	24918	Acetyl	18	1,19-DIACETYL	24918	Acetyl
19	1,20-DIACETYL	24919	Acetyl	19	1,20-DIACETYL	24919	Acetyl	19	1,20-DIACETYL	24919	Acetyl
20	1,21-DIACETYL	24920	Acetyl	20	1,21-DIACETYL	24920	Acetyl	20	1,21-DIACETYL	24920	Acetyl
21	1,22-DIACETYL	24921	Acetyl	21	1,22-DIACETYL	24921	Acetyl	21	1,22-DIACETYL	24921	Acetyl
22	1,23-DIACETYL	24922	Acetyl	22	1,23-DIACETYL	24922	Acetyl	22	1,23-DIACETYL	24922	Acetyl
23	1,24-DIACETYL	24923	Acetyl	23	1,24-DIACETYL	24923	Acetyl	23	1,24-DIACETYL	24923	Acetyl
24	1,25-DIACETYL	24924	Acetyl	24	1,25-DIACETYL	24924	Acetyl	24	1,25-DIACETYL	24924	Acetyl
25	1,26-DIACETYL	24925	Acetyl	25	1,26-DIACETYL	24925	Acetyl	25	1,26-DIACETYL	24925	Acetyl
26	1,27-DIACETYL	24926	Acetyl	26	1,27-DIACETYL	24926	Acetyl	26	1,27-DIACETYL	24926	Acetyl
27	1,28-DIACETYL	24927	Acetyl	27	1,28-DIACETYL	24927	Acetyl	27	1,28-DIACETYL	24927	Acetyl
28	1,29-DIACETYL	24928	Acetyl	28	1,29-DIACETYL	24928	Acetyl	28	1,29-DIACETYL	24928	Acetyl
29	1,30-DIACETYL	24929	Acetyl	29	1,30-DIACETYL	24929	Acetyl	29	1,30-DIACETYL	24929	Acetyl
30	1,31-DIACETYL	24930	Acetyl	30	1,31-DIACETYL	24930	Acetyl	30	1,31-DIACETYL	24930	Acetyl
31	1,32-DIACETYL	24931	Acetyl	31	1,32-DIACETYL	24931	Acetyl	31	1,32-DIACETYL	24931	Acetyl
32	1,33-DIACETYL	24932	Acetyl	32	1,33-DIACETYL	24932	Acetyl	32	1,33-DIACETYL	24932	Acetyl
33	1,34-DIACETYL	24933	Acetyl	33	1,34-DIACETYL	24933	Acetyl	33	1,34-DIACETYL	24933	Acetyl
34	1,35-DIACETYL	24934	Acetyl	34	1,35-DIACETYL	24934	Acetyl	34	1,35-DIACETYL	24934	Acetyl
35	1,36-DIACETYL	24935	Acetyl	35	1,36-DIACETYL	24935	Acetyl	35	1,36-DIACETYL	24935	Acetyl
36	1,37-DIACETYL	24936	Acetyl	36	1,37-DIACETYL	24936	Acetyl	36	1,37-DIACETYL	24936	Acetyl
37	1,38-DIACETYL	24937	Acetyl	37	1,38-DIACETYL	24937	Acetyl	37	1,38-DIACETYL	24937	Acetyl
38	1,39-DIACETYL	24938	Acetyl	38	1,39-DIACETYL	24938	Acetyl	38	1,39-DIACETYL	24938	Acetyl
39	1,40-DIACETYL	24939	Acetyl	39	1,40-DIACETYL	24939	Acetyl	39	1,40-DIACETYL	24939	Acetyl
40	1,41-DIACETYL	24940	Acetyl	40	1,41-DIACETYL	24940	Acetyl	40	1,41-DIACETYL	24940	Acetyl
41	1,42-DIACETYL	24941	Acetyl	41	1,42-DIACETYL	24941	Acetyl	41	1,42-DIACETYL	24941	Acetyl
42	1,43-DIACETYL	24942	Acetyl	42	1,43-DIACETYL	24942	Acetyl	42	1,43-DIACETYL	24942	Acetyl
43	1,44-DIACETYL	24943	Acetyl	43	1,44-DIACETYL	24943	Acetyl	43	1,44-DIACETYL	24943	Acetyl
44	1,45-DIACETYL	24944	Acetyl	44	1,45-DIACETYL	24944	Acetyl	44	1,45-DIACETYL	24944	Acetyl
45	1,46-DIACETYL	24945	Acetyl	45	1,46-DIACETYL	24945	Acetyl	45	1,46-DIACETYL	24945	Acetyl
46	1,47-DIACETYL	24946	Acetyl	46	1,47-DIACETYL	24946	Acetyl	46	1,47-DIACETYL	24946	Acetyl
47	1,48-DIACETYL	24947	Acetyl	47	1,48-DIACETYL	24947	Acetyl	47	1,48-DIACETYL	24947	Acetyl
48	1,49-DIACETYL	24948	Acetyl	48	1,49-DIACETYL	24948	Acetyl	48	1,49-DIACETYL	24948	Acetyl
49	1,50-DIACETYL	24949	Acetyl	49	1,50-DIACETYL	24949	Acetyl	49	1,50-DIACETYL	24949	Acetyl
50	1,51-DIACETYL	24950	Acetyl	50	1,51-DIACETYL	24950	Acetyl	50	1,51-DIACETYL	24950	Acetyl

28 Annex, UNION LIST OF FLAVOURINGS AND SOURCE MATERIALS, from the COMMISSION IMPLEMENTING REGULATION (EU) No 872/2012 of 1 October 2012 adopting the list of flavouring substances provided for by Regulation (EC) No 2232/96 of the European Parliament and of the Council, introducing it in Annex I to Regulation (EC) No 1334/2008 of the European Parliament and of the Council and repealing Commission Regulation (EC) No 1565/2000 and Commission Decision 1999/217/EC

Regarding their classification, we are familiar with the terms natural or artificial flavours, but the question is far more nuanced. Natural flavours are those obtained from material of vegetal, animal, or microbiological origin. However, there are also flavours whose artificial quality derives from the fact that they have been chemically synthesized in a laboratory. This refers to a process where simpler chemical components are used to produce more complex compounds. In terms of flavours, very often this means that a substance found in nature is replicated with the same components and formula in a laboratory although, in other instances, new compounds not found in natural ingredients might also be created.

One of the first applications of synthetic flavours in food is mentioned in a chemistry report on the London World's Fair of 1851 for the British Royal Society. Among the technical and cultural curiosities displayed at Crystal Palace, the German chemist August Hoffmann described how advances in organic chemistry invited new combinations and variety in perfume making, “the applications of which were at the same time practically illustrated by confectionery flavoured by them ... in visiting the stalls of English and French perfumers at the Crystal Palace.” Although flavours contain at least several dozen elements that make them what they are, there are some, especially fruity ones, where only a few compounds define the identity of their signal. These are the esters, whose “striking similarity” to the smell of fruit “had not escaped the observation of chemistry,” as Hoffmann already indicated at the time.



29 Lucta old advertisements (left, c.1950; right, c. 1970). Lucta archive.

Vanillin was the first flavour synthesized in a laboratory. Its chemistry, 4-hydroxy-3-methoxybenzaldehyde ($C_8H_8O_3$), is the fundamental component of vanilla beans, making it useful to evoke their flavour without using an actual vanilla plant. Vanillin was first isolated in 1858. Twenty years later, its structure and the way to synthesize it from a glycoside found in pine trees had been discovered, a method that would evolve rapidly so that by the end of the nineteenth century it was already being marketed with great success. Those first flavourings reproduced vanilla or fruit flavours and formed the heart of the first companies dedicated to this field. In Spain, Lucta (Spain, 1948, private company) was founded in 1948 in Barcelona, and originally, it also produced these first fruit flavours for ice cream, desserts, or candies. Today it has an international projection, and in between its Barcelona headquarters and its research laboratories at the Research Parc of the Universitat Autònoma de Barcelona, artistry is combined with high technology to create complex perfumes and flavourings used worldwide.

The process is simple. Sometimes, it is the Lucta team that comes up with new flavours which did not exist before. On other occasions, they respond to a client briefing which carries the characteristics of the flavour, the mouthfeel, the price per kilogram, etc. With this briefing the client also provides a flavourless food base onto which different aromas will be tested (e.g., a yoghurt or a biscuit). After seventy-five years in the business, Lucta has a flavouring library (“aromateca”) with more than a thousand items. However, the response to this kind of briefings from the food industry is usually the design of a new taste from scratch. The moment the flavourist is aware of the demands from the client, their imagination is awakened. Their body manages a palette of four to five hundred ingredients, and the company one of around four thousand. From there they start to imaginatively compound the new flavour. They do this out of their own personal repertoire and experience, knowing quite well that in this field, one plus one does not equal two. There are complex chemical dynamics and nuances—like mixes that might enhance one flavour while blocking another. This turns their work into an art brought to life through the chemical formulas they model on their computers. From there, a robot will turn these formulas into a concentrated substance to be applied to the flavourless base provided by the client. Once a version is selected, that extract will be prepared in large amounts.

Today the union of neuroscience and artificial intelligence opens a new stage in these design processes, making it possible to link components with sensations through a very extensive collection of data thanks to brain scans. The Swiss company Givaudan (Switzerland, 1895, SWX: GIVN: 2.962,00 CHF +74,00 [2,56 %]↑) has created the platform Myrissi™, which offers a “visual mood board” as well as a “verbal ecosystem” around a given fragrance, creating multisensorial connections which permit to “smell visuals” and align emotions, colours and scents.

Bliss

If taste and smell account for 80 to 90 percent of our direct perception of flavours, the remaining margin includes issues such as the texture or the sound it makes in our mouth. In 2004, Jorge Ríos, the Spanish chemist behind Flanín, wrote that even today the most important aspect of designing a powdered flan is to produce a perfect demoulding—the playful experience associated with this dessert, turning it upside down and taking away the cup to find a perfect and little shaky form. Throughout the world, from experimental chefs to scientists at food companies, there is extensive work being done around the physical structure of basic food components such as salt, fats, and sugar to transform their textures and effects on our senses. Scientists at Cargill (USA, 1865, private company), one of the largest salt producers in the United States, have pulverized salt into a powder so fine (Alberger® Flake Salt) that it hits the taste buds faster and harder, creating a “flavour burst.” Meanwhile, Nestlé (Switzerland, 1866, SWX: NESN: 111,88 CHF +1,62 [1,47 %] ↑) has modified the distribution and shape of fat globules to modify their absorption rate, and consequently, their texture and mouthfeel. Unilever (UK, 1929, LON: ULVR - 51.18+0.08 [+0.16%] ↑), meanwhile, produces a “super crispy” veggie burger (Ingredients: Vegetable protein base (50%) (water, SOY protein, WHEAT gluten, starch), WHEAT flour, water, vegetable oils (turnip rape, sunflower), fibres (bamboo, psyllium, OATS), starch (tapioca, WHEAT), thickener (methyl cellulose), salt, natural flavours, WHEAT gluten, yeast extract, acidity regulator (potassium acetate), dextrose, raising agents (diphosphates, sodium carbonates), alcohol vinegar, sugar, yeast, acidulant (citric acid), spices and aromatic herbs, spices and aromatic herbs extract (contains celery), onion powder, garlic powder, iron, vitamin B12. May contain barley, mustard and sesame.)¹⁶ To achieve this gratifying effect of “crunchiness”, additives such as calcium chloride—a salt (CaCl₂)—or dextrans—carbohydrates produced from starch through enzymes or thermal processes—are used.

These designs seek to create blends that keep us coming back for more, that is, to find what researcher Howard Moskowitz called the “bliss point” where a blend is neither too sweet making us feel full too quickly, nor so tasteless that we do not want to eat more. In 2004, the American soft drink brand Dr. Pepper, now owned by Keurig Dr Pepper (US, 2008 [1885], NASDAQ: KDP: 35,23 USD +0,090 [0,26 %] ↑) enlisted the services of Moskowitz, who is trained in the fields of experimental psychology and mathematics, to revitalize the brand with a new flavour. Sixty-one different formulations were prepared—thirty-one for the sweetened version and thirty for the light version—all with simple variations in taste. Groups of testers in four different cities around the country began the “tastings,” then answered a series of questions to gauge their sensations. These were scored from 0 to 100. This translation of psychophysical signals into quantifiable scales made

¹⁶ The growing vegan food market represents a new field of sensory design where the use of flavorings and additives are essential to play with consumer perception and simulate foods that taste, feel and look just like their originals, from cheddar-flavored vegan cheese slices to bleeding burgers.

it possible to relate the consumer's evaluations of the different formulations, thus refining all the variables. From there, Moskowitz explains how “you can build a mathematical model that shows you exactly the relation between what's under your control and how consumers respond. Bingo. You engineer the product.”

Increased computing power and models have meant that what began in the early 2000s with a database, now and thanks to Dr. Pepper, has joined hands with contemporary neuromarketing to produce Mind Genomics®, or, in Moskowitz's words, “the sequencing of the consumer's mind,” a thorough study of the signals attended by the human brain to evaluate new products.

Extended Digestion

Moskowitz's work touches on everything from the formula of components that will reach the stomach to the palatable textures in the mouth. As early as 1893, MIT biologist William T. Sedgwick wrote a text entitled “On external digestion, commonly called alimentation”. He did so in the *Rumford Kitchen Leaflets*, edited by the champion of home economics, Ellen Richards. Sedgwick spoke of the need to think of digestion as a process that went far beyond the stomach: “Alimentation, or the preparation of food for digestion within the body, is only another name for a long series of processes, essentially digestive, outside the body.”

Charles Spence, a professor at Oxford University who specializes in experimental psychology and multisensory perception, has popularized the term gastrophysics to define everything that constitutes the experience of eating, except the food itself. He speaks of the role of sensory signals in the places where we eat or the fact that the price of a food influences its taste. This extended digestion parallels the extended design of foodstuffs that years ago already became products. A design which is sometimes used to support, modulate and direct digestion with a clear goal in mind: stomach share. Share in the sense defined by the Oxford English Dictionary, as one of the equal parts into which a company's capital is divided, entitling the holder to a proportion of the profits. It's been a long time since the body and its labour were turned into capital as shown by political scientist C.B. Macpherson in his *Political Theory of Possessive Individualism* (1962). For quite a while now its metabolism is being claimed as raw material for commercial exchange while our digestive process in its extended dimension is constructed as an asset on which to exert pressure through the design of the digestive medium or foodscape where this extended process takes place.

An Architecture of Sign(al)s

If we all submit to the “bliss point”, which is nothing but a statistical average, the scope of our surrounding world is reduced. The greater the diversity of that which can affect us, i.e., the more we fully inhabit and are in touch with the world, the greater our freedom and power of action is, simply because we are able to better establish more nuanced strategies to become one with it.

At the end of *Joseph Anton* (2012), Salman Rushdie describes an instinctive knowledge that “literature [attempts] to open up the universe, to increase, even if [it is] only a little, the sum total of what for human beings [it is] possible to perceive, to understand, and therefore, ultimately, to be.” This enlargement is often at odds with a restrictive use of infrastructural semiotics which sets “right ways” to steer behaviours along them, harnessing subjectivities, governing senses, or designing affective reactions. The growth of these infrastructural semiotics reveals the importance of valuing the difference between multiplying meanings and senses, and with them uncertainty and risk or reducing them so that they flow smoothly within the limits of safety and comfort. There can be no single right way without the question of who decides on it and its potential evolution? We cannot define all amplitude as Good and all delimitation as Bad, eternal truths that we would write with capital letters. On the contrary, we must acknowledge that there are good and bad encounters; there are those that have an affinity with our body, blending with it and increasing its capacity for action, while there are others that immobilize it to the point of causing its death, turning it into a passive receiver instead of an agent constantly mixing with its environment.¹⁷

Faced with the impossibility of reducing reality to binary functions that undoubtedly make the task much easier but inevitably deny the complexity of life, we are urged to recognize the technical dimension of infrastructural semiotics, and by extension, of its condition of *pharmakon*, both as remedy and as poison. And along with this recognition, the immediate demand for their active assessment. Active insofar as it is not blindly outsourced but political, commonly produced within our plural biotechnical and more-than-human agencies.

This journey through some of the traces, sets and semiotic processes of the food medium that gently touches and arranges matter, provoking sensations, behaviours or ideas, seeks to provoke awareness, bewilderment and disquiet against black boxed and outsourced beliefs. It also arises from the need for other concepts, tools and practices with which to understand, value and mediate in the spatial conflicts and forms of environmentality. Like with any infrastructure, environmentality’s semiotics draw fields of possibility, supporting some actions and excluding others. However, we do not usually pay attention to the relationship with the possible that every infrastructure articulates, only to the function it ensures. Can we imagine a practice that combines infrastructural semiotics and *other* somatic or raw semiotics that do not seek to codify the totality of our existence? A practice that plays again with functions *and* possibilities? A right path to be programmed in one way or another does not always exist, and even when it does, it is always prone to evolve. Against the disintegration of reason in favour of conflicting technical rationalities, it might be time to take care of

¹⁷ In a series known as the “letters of evil,” Spinoza wrote to his correspondent that the apple of the Christian Paradise did not represent Evil, but a poison, that is, a bad encounter that broke down the relationships that defined Adam and Eve as individuals. The apple for other modes of existence or in other circumstances could represent a good encounter, perhaps it possessed a toxin that in small doses could be a remedy. So God’s message appears not as a command, but as a warning (or labeling): be careful.

the instinctive confidence we have in our need to expand our world, giving (and giving it) room to breathe and invent other possible ones.

[The author wishes to acknowledge the help provided by Isabel Peña-Rey and her team at AESAN (Agencia Española de Seguridad Alimentaria y Nutrición); the laboratory staff at CNA (Centro Nacional de Alimentación); Juana Frías and her team at ICTAN (Instituto de Ciencia y Tecnología de Alimentos y Nutrición); Robinson Ortiz of La Pereirana, and Camilo Mutis for establishing the Colombian connection; and Carlos Ventós and his team at Lucta].

For the Spanish pavilion at the Venice Architecture Biennale, photographer Pedro Pegenaute was commissioned to visit over 50 sites throughout Spain. For this recipe, he produced the following work.



La Pereirana Colombian bakery, Madrid



Instituto de Ciencia y Tecnología de Alimentos y Nutrición (ICTAN), Madrid



Lucta factory, Barcelona



Agencia Española de Seguridad Alimentaria y Nutrición (AESAN), Madrid



Lucta factory, Barcelona



Laboratory at the Centro Nacional de Alimentación, Madrid

Bibliography.

- Agudelo, Valeria, Burbano, Valentina, Juan Manuel Ocampo, Andrés Felipe Rodríguez, Carlos Mejía, and Juan Sebastián Ramírez-Navas. 'La Almojábana, una Delicia que Viajó a través de las Culturas'. *Heladería Panadería Latinoamericana*, no. 281 (n.d.): 52–60.
- Barenstein, Nadia. 'The Inexorable Rise of Synthetic Flavors: A Pictorial History'. *Popular Science* (blog), 24 November 2015. <https://www.popsci.com/history-flavors-us-pictorial/>.
- Barthes, Roland. 'Por una Psico-Sociología de la Alimentación Contemporánea'. *EMPIRIA. Revista de Metodología de Ciencias Sociales*, no. 11 (2006): 205–21.
- BettyCrocker.com. 'The Betty Crocker Kitchens', 10 January 2017. <https://www.bettycrocker.com/betty-crocker-kitchens>.
- . 'The Story of Betty Crocker', 5 October 2021. <https://www.bettycrocker.com/menus-holidays-parties/mhplibrary/parties-and-get-togethers/vintage-betty/story-of-betty-crocker>.
- Bhasin, Kim. 'Go Inside the Secret Test Kitchen where McDonald's Invents New Menu Items'. *Business Insider*, 15 February 2013. <https://www.businessinsider.com/photos-mcdonalds-test-kitchen-2013-2>.
- Boseley, Sarah, and Sarah Boseley Health editor. 'Food Firms Could Face Litigation over Neuromarketing to Hijack Brains'. *The Guardian*, 25 May 2018, sec. Society. <https://www.theguardian.com/society/2018/may/25/food-firms-may-face-litigation-over-neuromarketing-to-hijack-brains>.
- Carranza Quispe, Luis Emilio. 'Fisiología del apetito y el hambre'. *Enfermería Investiga: Investigación, Vinculación, Docencia y Gestión* 1, no. 3 (2016): 117–24.
- Coleman, Beth. 'Technology of the Surround'. *Catalyst: Feminism, Theory, Technoscience* 7, no. 2 (26 October 2021). <https://doi.org/10.28968/cftt.v7i2.35973>.
- Cotelo-Guerra, Dolores. 'Una iniciativa pública de capacitación profesional femenina en el primer tercio del siglo XX: la Escuela del Hogar y Profesional de la Mujer de Madrid'. *Innovación educativa*, no. 26 (2016): 59–75.
- Crane, Eva. 'The Rock Art of Honey Hunters'. *Bee World* 86, no. 1 (1 January 2005): 11–13. <https://doi.org/10.1080/0005772X.2005.11099642>.
- Devesa, J.A., Pedro Luis Ortiz Ballesteros, and Adolfo Francisco Muñoz Rodríguez. 'Breve Reseña Histórica de La Apicultura En España'. *Vida Apícola*, no. 25 (1987): 63–65.
- Easterling, Keller. *Extrastatecraft: The Power of Infrastructure Space*. London; New York: Verso Books, 2014.
- . *Medium Design: Knowing How to Work on the World*. London: Verso Books, 2021.
- Espiegel Alonso, Carmen, and Gustavo Rojas. 'La Estela de las Ingenieras Domésticas Americanas en la Vivienda Social Europea / The Trail of American Domestic Engineers in European Social Housing'. *Proyecto, Progreso, Arquitectura*, no. 18 (15 May 2018): 58–73. <https://doi.org/10.12795/ppa.2018.i18.04>.
- Fernandez Cardoso, Florencia. 'Deux cuisines médiatisées et leur transgression de genre : le cas de Bernège et Hefner'. *Livraisons de l'histoire de l'architecture*, no. 35 (15 June 2018): 99–109. <https://doi.org/10.4000/lha.968>.
- Fincher, Melanie. 'The Long and Surprising History of Boxed Cake Mix'. *AllRecipes* (blog), 5 January 2022. <https://www.allrecipes.com/article/history-of-boxed-cake-mix/>.
- Gabrys, Jennifer. 'Programming Environments: Environmentality and Citizen Sensing in the Smart City'. *Environment and Planning D: Society and Space* 32, no. 1 (1 February 2014): 30–48. <https://doi.org/10.1068/d16812>.
- García Sánchez, Expiración. 'El Azúcar en la Alimentación de los Andalusíes'. In *Actas Del Primer Seminario Internacional La Caña de Azúcar En Tiempos de Los Grandes Descubrimientos (1450-1550)*, 209–31. Granada: Junta de Andalucía, 1990.
- 'Givaudan Leads the Future of Consumer-Centred Digital Capabilities with Its Technology Myrissi™ | Givaudan'. Accessed 28 March 2023. <https://www.givaudan.com/media/media-releases/2023/translating-scents-with-myrissi>.
- Gómez Fernández, Ana Belén. 'La llegada de las cátedras ambulantes de Sección Femenina a Sierra Mágina'. *Sumuntán: anuario de estudios sobre Sierra Mágina*, no. 28 (2010): 89–104.

- Gómez Mendoza, Antonio. 'Hacia una economía del frío. El plan de red frigorífica nacional, 1947-1951'. *Documentos de trabajo de la Facultad de Ciencias Económicas y Empresariales*, no. 12 (1995): 1–57.
- Goodacre, Megan. 'Symphony of Efficiency: The UX Lessons in The Founder'. Accessed 9 February 2023. <https://megangoodacre.com/Symphony-of-efficiency-1>.
- Hernández-Pacheco, Eduardo. *Las pinturas prehistóricas de las Cuevas de la Araña (Valencia) : Evolución del arte rupestre de España*. Madrid: Junta para Ampliación de Estudios e Investigaciones Científicas; Museo Nacional de Ciencias Naturales, 1924. <http://simurg.bibliotecas.csic.es/view/465363>.
- Huici Miranda, Ambrosio. *La Cocina Hispano-Magrebí Durante La Época Almohade : Según Un Manuscrito Anónimo Del Siglo XIII*. Gijón: Trea, 2016.
- Jaime Gómez, José de, and José María de Jaime Lorén. *Historia de La Apicultura Española*. 3 vols. Calamocha (Teruel), 2001.
- Jalón Oyarzun, Lucía. 'Excepción y cuerpo rebelde: lo político como generador de una arquitectónica menor / Exception and the rebel body: the political as generator of a minor architecture'. Phd, E.T.S. Arquitectura (UPM), 2017. <http://oa.upm.es/48250/>.
- . 'Épicas Menores y Afecto Común'. In *El Gran Río*, 13–22. Madrid: Círculo de Bellas Artes, 2018.
- . 'La Apariencia de un Toque Humano, o el Diseño de la Pasividad Hiperactiva'. *Revista de Occidente*, no. 453 (February 2019): 49–64.
- . 'Windowish Practices, Unreadable Backgrounds and Raw Semiotics. Tracing Minor Architectures and Ecologies of Signs in Women's Writing'. *ZARCH*, no. 18 (2 September 2022): 210–19. https://doi.org/10.26754/ojs_zarch/zarch.2022186216.
- LaGorce, Tammy. 'The Tastemakers'. *New Jersey Monthly*, 17 January 2011. <https://njmonthly.com/articles/eat-drink/the-tastemakers/>.
- Langreo Navarro, Alicia, and Luis Gonzalo Germán Zubero. 'Transformaciones en el sistema alimentario y cambios de dieta en España durante el siglo XX'. *Historia agraria: Revista de agricultura e historia rural*, no. 74 (2018): 167–200.
- Marinetti, Filippo Tommaso. *La cocina futurista: una comida que evitó un suicidio*. Campo de estrellas. Barcelona: Gedisa, 2014.
- Marlowe, Frank W., J. Colette Berbesque, Brian Wood, Alyssa Crittenden, Claire Porter, and Audax Mabulla. 'Honey, Hadza, Hunter-Gatherers, and Human Evolution'. *Journal of Human Evolution, The Other Faunivory: The Significance of Insects & Insect Resources for Nonhuman Primates, Modern Humans, & Extinct Hominins*, 71 (1 June 2014): 119–28. <https://doi.org/10.1016/j.jhevol.2014.03.006>.
- Moss, Michael. *Salt, Sugar, Fat: How the Food Giants Hooked Us*. New York: Random House, 2013.
- National Institutes of Health (NIH). 'How the Nose Decodes Complex Odors', 11 May 2020. <https://www.nih.gov/news-events/nih-research-matters/how-nose-decodes-complex-odors>.
- Notaker, Henry. *A History of Cookbooks: From Kitchen to Page over Seven Centuries*. Berkeley: University of California Press, 2017.
- OCU. 'Aditivos alimentarios para el mantenimiento de productos'. Accessed 2 March 2023. <https://www.ocu.org/alimentacion/seguridad-alimentaria/calculadora/aditivos>.
- Page, Kathleen A., and Robert S. Sherwin. 'Opinion | The Brain: Our Food-Traffic Controller'. *The New York Times*, 26 April 2013, sec. Opinion. <https://www.nytimes.com/2013/04/28/opinion/sunday/the-brain-our-food-traffic-controller.html>.
- Pager, H. 'Rock Paintings in Southern Africa Showing Bees and Honey Hunting'. *Bee World* 54, no. 2 (1 January 1973): 61–68. <https://doi.org/10.1080/0005772X.1973.11097456>.
- Pare, Sascha. 'Brain Scan: Pictures of Food Appear to Trigger Specific Neurons, Scientists Find'. *The Guardian*, 25 August 2022, sec. Science. <https://www.theguardian.com/science/2022/aug/25/pictures-food-trigger-specific-neurons-brain>.
- Park, Michael Y. 'A History of the Cake Mix, the Invention That Redefined "Baking"'. *Bon Appétit*, 26 September 2016. <https://www.bonappetit.com/entertaining-style/pop-culture/article/cake-mix-history>.

- Peinado Gracia, María Luisa. *El consumo y la industria alimentaria en España: evolución, problemática y penetración del capital extranjero a partir de 1960*. Madrid : Instituto de Estudios Agrarios, Pesqueros y Alimentarios, 1985.
- Pérez Samper, María Angeles. *Comer y beber: una historia de la alimentación en España*. 1a ed. Historia (Cátedra). Madrid: Cátedra, 2019.
- . 'Los recetarios de mujeres y para mujeres: Sobre la conservación y transmisión de los saberes domésticos en la época moderna'. *Cuadernos de Historia Moderna*, no. 19 (1997): 121–56.
- Pérez-Villanueva Tovar, Isabel. 'La Escuela del Hogar y Profesional de la Mujer y las enseñanzas domésticas (1911-1936)'. *Arenal: Revista de historia de las mujeres* 22, no. 2 (2015): 313–45.
- Porsche HOME - Porsche USA. 'Where the Music Comes From - Porsche USA'. Accessed 17 February 2023. <https://www.porsche.com/usa/aboutporsche/christophorusmagazine/archive/369/articleoverview/article06/>.
- Puig de la Bellacasa, Maria. *Matters of Care. Speculative Ethics in More than Human Worlds*. Minneapolis, Minn.: University of Minnesota, 2017.
- Rama Dellepiane, Ruth. 'Evolución y características de la alimentación fuera del hogar y del consumo de alimentos procesados en España'. *Agricultura y sociedad*, no. 84 (1997): 107–40.
- Restrepo Manrique, Cecilia, and Verónica Sánchez de Ospina. 'La Famosa Almojábana de Soacha y Su Historia'. *Historia de La Cocina y La Gastronomía* (blog), 27 September 2016. <https://www.historiacocina.com/es/almojabana-de-soacha>.
- Seo, Han-Seok. 'Sensory Nudges: The Influences of Environmental Contexts on Consumers' Sensory Perception, Emotional Responses, and Behaviors toward Foods and Beverages'. *Foods* 9, no. 4 (April 2020): 509. <https://doi.org/10.3390/foods9040509>.
- Shapiro, Laura. *Perfection Salad: Women and Cooking at the Turn of the Century*. Berkeley: University of California Press, 2008.
- . *Something from the Oven: Reinventing Dinner in 1950's America*. New York: Viking, 2004.
- Sherman, Sandra. 'Printed Communities: Domestic Management Texts in the Eighteenth Century'. *Journal for Early Modern Cultural Studies* 3, no. 2 (2003): 36–67. <https://doi.org/10.1353/jem.2003.0011>.
- Soria-Gómez, Edgar, Luigi Bellocchio, Leire Reguero, Gabriel Lepousez, Claire Martin, Mounir Bendahmane, Sabine Ruehle, et al. 'The Endocannabinoid System Controls Food Intake via Olfactory Processes'. *Nature Neuroscience* 17, no. 3 (March 2014): 407–15. <https://doi.org/10.1038/nn.3647>.
- Spence, Charles, Katsunori Okajima, Adrian David Cheok, Olivia Petit, and Charles Michel. 'Eating with Our Eyes: From Visual Hunger to Digital Satiation'. *Brain and Cognition*, Food for thought: The functional and neural mechanisms of food perception and choice, 110 (1 December 2016): 53–63. <https://doi.org/10.1016/j.bandc.2015.08.006>.
- Stierwalt, Everyday Einstein Sabrina. 'Why Do Smells Trigger Memories?' Scientific American. Accessed 31 March 2023. <https://www.scientificamerican.com/article/why-do-smells-trigger-memories1/>.
- Thaler, Richard H., and Cass R. Sunstein. *Nudge: Improving Decisions about Health, Wealth, and Happiness*. New Haven: Yale University Press, 2008.
- Tremblay, Angelo, and France Bellisle. 'Nutrients, Satiety, and Control of Energy Intake'. *Applied Physiology, Nutrition, and Metabolism* 40, no. 10 (October 2015): 971–79. <https://doi.org/10.1139/apnm-2014-0549>.
- Uexküll, Jakob von. *Andanzas por los mundos circundantes de los animales y los hombres*. Argentina: Cactus, 2016.
- Vinciguerra, Lorenzo. *La Semiótica de Spinoza*. Buenos Aires: Cactus, 2020.
- Wadhera, Devina, and Elizabeth D. Capaldi-Phillips. 'A Review of Visual Cues Associated with Food on Food Acceptance and Consumption'. *Eating Behaviors* 15, no. 1 (1 January 2014): 132–43. <https://doi.org/10.1016/j.eatbeh.2013.11.003>.
- Wooding, Stephen. 'A Taste for Sweet – an Anthropologist Explains the Evolutionary Origins of Why You're Programmed to Love Sugar'. Yahoo! News, 24 December 2022. <https://news.yahoo.com/taste-sweet-anthropologist-explains-evolutionary-200154725.html>.

Writer, Colleen Walsh Harvard Staff. 'How Scent, Emotion, and Memory Are Intertwined — and Exploited'. *Harvard Gazette* (blog), 27 February 2020. <https://news.harvard.edu/gazette/story/2020/02/how-scent-emotion-and-memory-are-intertwined-and-exploited/>.

Zabalza Seguí, Ana. 'Teoría versus biografía. Los "Manuales de Economía doméstica" del Marqués de San Adrián (1772)'. *Nuevo Mundo Mundos Nuevos. Nouveaux mondes mondes nouveaux - Novo Mundo Mundos Novos - New world New worlds*, 28 January 2008. <https://doi.org/10.4000/nuevomundo.21683>.