HOSPITALITY TECHNOLOGY RESEARCH · EDITION 2026

The Digital Dining Shift

What the research actually establishes about menus, digital ordering and restaurant margin — and what the industry has been repeating without a source.

WHERE A FULL-SERVICE RESTAURANT SALES DOLLAR GOES

2.8%
median income before taxes

FOUR NUMBERS THAT FRAME THE DECISION

2.8%
median pre-tax margin, US full-service restaurants

+11.9%
FAO sugar price index, in a single month

59%
of full-service diners would open a menu by QR code

47%
say they are not comfortable using QR codes to do so

THREE CLAIMS THIS REPORT COULD NOT SOURCE — AND DOES NOT REPEAT

"Photos raise sales 30%"
No primary study exists. The real finding is conditional — §5.

"QR menus lift AOV 28%"
No peer-reviewed study measures QR effect on order value — §6.

"Menus cost $1,200 a year"
Every figure in circulation traces to a vendor blog — §12.

The case for digital menu infrastructure does not need these numbers. This report makes it without them.

Research report · September 2026 · Data current to Q3 2026
Scope: Menu design evidence, digital and QR ordering, restaurant cost structure, table turnover, allergen and calorie compliance, and multilingual service
Sources: 45 cited references, including peer-reviewed research from the *Journal of the Academy of Marketing Science*, *International Journal of Hospitality Management*, *Journal of Consumer Research*, *Journal of Consumer Psychology*, *Journal of Hospitality and Tourism Management*, *British Food Journal* and *Judgment and Decision Making*, alongside Cornell University's Center for Hospitality Research, Columbia Business School, the US National Restaurant Association, Deloitte, the FAO, USDA, the US Bureau of Labor Statistics, Eurostat, EUR-Lex, UK legislation and DHSC guidance, the US FDA, and the Turkish Ministry of Agriculture and Forestry
Published by: QRMenu.link — see the sourcing and independence statement in §2

CONTENTS

What this report covers

AN UNUSUAL THING FOR A VENDOR TO PUBLISH

This report is published by a digital menu platform. It contains a section (§7) devoted to peer-reviewed research finding that QR menus *reduce* customer loyalty, a section (§12) listing what the literature fails to establish about the publisher's own product category, and a front cover naming three industry statistics that could not be sourced.

That is deliberate. A document that only reports favourable findings is marketing, and readers can tell. The argument for digital menu infrastructure is strong enough to be made from verified evidence alone — and considerably more persuasive when the counter-evidence is on the same page.

SECTION 01

Executive summary

A full-service restaurant in the United States earned a median of 2.8 cents of pre-tax income on every dollar of sales in 2024. Every argument in this report follows from that number.

At that margin, the menu is not a design artefact. It is the interface through which almost all revenue is selected, the only lever that can be adjusted without touching the kitchen, the supply chain or the payroll — and, when printed, the slowest-moving component in a business whose input costs move monthly.

2.8%
Median income before taxes, US full-service restaurants, 2024[1]

36%
Share of that margin consumed by a one-point rise in food cost ratio[1,2]

8.7 pts
Labour cost gap between profitable and unprofitable operators[2]

+11.9%
FAO sugar price index movement in one month, August 2026[3]

Eight findings

1 — The margin menu decisions operate on is 2.8 per cent. The National Restaurant Association's *Restaurant Operations Data Abstract*, drawing on financial and operational data from more than 900 restaurants, reports median income before taxes of 2.8 per cent of sales for full-service operators and 4.0 per cent for limited-service.[1] INSTITUTIONAL

2 — A single percentage point of food cost consumes roughly 36 per cent of that margin. Food and non-alcohol beverage costs ran a median 32.0 per cent of sales for full-service operators in 2024.[2] One point of movement on that ratio is 1.0 point against a 2.8-point margin. AUTHOR'S CALCULATION

3 — Input costs move faster than a printed menu can follow. The FAO Food Price Index sugar sub-index rose 11.9 per cent in the single month of August 2026.[3] USDA forecasts US food-away-from-home prices up 3.6 per cent in 2026;[4] the Bureau of Labor Statistics recorded full-service meals up 3.5 per cent over the twelve months to August 2026.[5] OFFICIAL

4 — The labour gap between profitable and unprofitable operators is 8.7 percentage points. Profitable full-service operators held salaries and wages to a median 34.2 per cent of sales; unprofitable ones ran 42.9 per cent.[2] Any intervention that shifts labour from order-taking to service acts directly on this gap.

5 — The best-evidenced menu interventions concern price format and item position, not photographs. Cornell researchers found diners given numeral-only prices spent approximately 8 per cent more — an average of $5.55 per person — than those shown a currency symbol (n = 201).[6] Items placed at the beginning or end of a category list were "up to twice as popular" as the same items placed centrally, replicated in the field across 492 orders.[7] PEER-REVIEWED

6 — The industry's "sweet spot" convention is contradicted by eye-tracking. An infrared eye-tracking study found **no evidence** of a menu sweet spot where diners' eyes dwell longest. Diners read menus sequentially, like a book.[8] Decades of menu-design advice rests on a premise that measurement did not support.

7 — Digital ordering does raise spending — but no published figure says by how much. Research in the *Journal of the Academy of Marketing Science*, reviewing more than 23,000 orders across six field studies, found that digital ordering "leads consumers to have a more automatic decision making mode and lower cognitive involvement, which results in more indulgent outcomes in the form of unhealthy food orders and higher overall spending."[9] The authors publish a magnitude for the dietary effect (61 per cent of digital orders unhealthy, more than three points higher than non-digital) but not for the spending effect.[10]

8 — QR menus carry a measured downside, and it belongs in the decision. Research in the *Journal of Hospitality and Tourism Management* found that "QR code menus diminish customer loyalty (compared to traditional menus) due to perceived inconvenience."[11] Separately, 47 per cent of surveyed consumers said they were not comfortable using QR codes in restaurants, rising to 65 per cent among those aged 60 and over.[12] Section 11 builds both findings into the specification rather than around them.

Three claims that did not survive checking

"Menu photographs increase sales by 30 per cent." No primary study supports this. Every instance traced resolves to a marketing article citing another marketing article. The genuine peer-reviewed finding is conditional: photographs raise attitudes, willingness to pay and purchase intention for dishes with *common, descriptive* names — but for ambiguously named dishes they help only some consumers, and visual processors show *less* favourable outcomes with pictures than without.[13] That is a more useful finding than the invented one, and §5 explains how to act on it.

"QR menus increase average order value by 28 per cent." We found no peer-reviewed study measuring the effect of QR menus specifically on average order value, order accuracy, table turnover or labour efficiency. This is a real hole in the literature and §12 states it as such. The nearest rigorous evidence concerns digital ordering modes generally, and reports direction without magnitude.[9]

"Printed menus cost the average restaurant $1,200 a year." Every figure of this kind in circulation traces to a company selling digital menus. We checked a commercial menu *printer* with the opposite commercial incentive; its published cost page carries no per-unit pricing at all. This report therefore makes no claim about print cost, and §4 argues the real cost of a printed menu is repricing latency, not printing.

SECTION 02

Method, sourcing and independence

Sourcing rules

One — the original study, not the summary. Behavioural findings are cited to the journal that published them, with sample sizes and study designs stated wherever the source discloses them. Where a source does not disclose its sample size — and several widely-cited industry surveys do not — we say so at the point of citation.

Two — vendor-reported material is labelled. Figures published by companies selling the product under discussion appear marked VENDOR-REPORTED and are never presented as research. Several are useful; none is load-bearing.

Three — unsourceable claims are named, not quietly dropped. Three of the most frequently repeated statistics in this category could not be traced to any primary source. Rather than omit them and leave readers to encounter them elsewhere, §1 names them.

Four — counter-evidence is included at full strength. Where research contradicts the commercial case — on QR menus and loyalty, on choice overload, on consumer discomfort — it appears in the body of the report with its own sample sizes, not in a footnote.

On one excluded source

A frequently cited 2001 study reporting that descriptive menu labels increased sales by 27 per cent has been excluded from this report. The study itself carried no retraction notice when we checked, but its lead author was subsequently found by his university to have committed academic misconduct including "misreporting of research data" and "problematic statistical techniques" in his research and scholarship.[14] We judged the figure unusable. Readers will find it in most menu-design articles; they will not find it here.

Independence statement

This report is published by QRMenu.link, which sells digital menu software. No QRMenu.link usage data appears in the analysis, no competitor is cited as a source of fact, and the sections most likely to inform a purchasing decision — §7 and §12 — contain the evidence least favourable to the publisher. Every source is linked in §13.

EVIDENCE CLASSIFICATION

PEER-REVIEWED
Published in an academic journal after external review.

OFFICIAL
Government body, statistics agency or regulator.

INSTITUTIONAL
Trade association, university research centre or professional services firm.

CALCULATION
Derived by the authors from cited inputs, shown in full.

VENDOR-REPORTED
Published by a commercially interested party. Indicative only.

GEOGRAPHIC SCOPE

Cost and margin data are predominantly United States, because that is where consistent operator-level data is published. Compliance material covers the EU, UK, US and Türkiye. Behavioural findings are cited from wherever the study was run and the location is stated.

A CAUTION ON TRANSFER

US margin structures should not be assumed to hold in markets with different labour law, tipping norms or tax treatment. The *relationships* in §3 — that a thin margin amplifies small cost movements — transfer; the absolute percentages do not.

SECTION 03

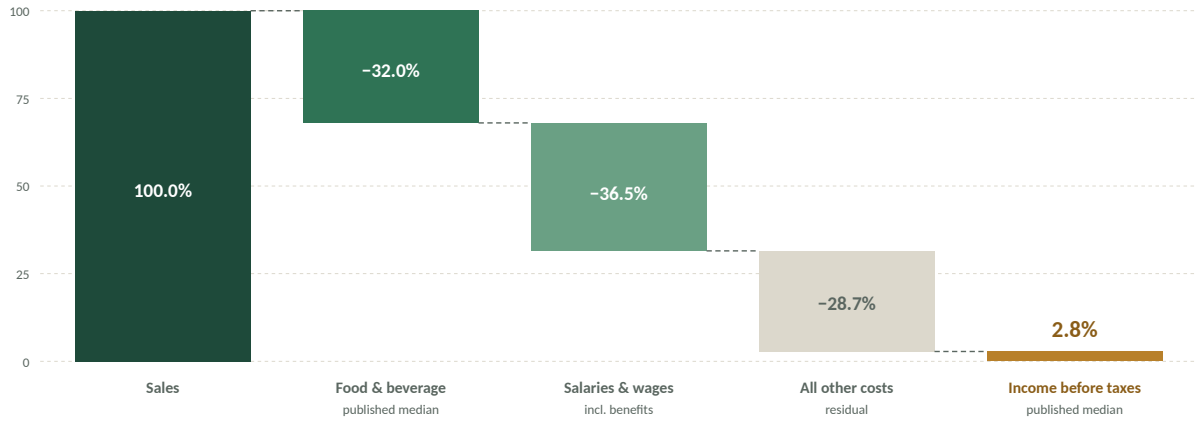
The margin context

Restaurant economics are widely discussed and rarely quantified. The published operator data shows a business in which almost the entire sales dollar is already committed before anyone thinks about profit.

The National Restaurant Association's *Restaurant Operations Data Abstract*, built from financial and operational data supplied by more than 900 restaurants, reports for 2024: median income before taxes of **2.8 per cent of sales** in full-service and **4.0 per cent** in limited-service, with limited-service prime costs running "a median of 65 cents of every sales dollar."[1] INSTITUTIONAL The Association's *State of the Restaurant Industry* 2025 states the operating requirement plainly — operators must maintain "pre-tax margins of 3-5 per cent" — and notes that average food costs and average restaurant wages were each up more than 30 per cent from 2019.[15]

Where the full-service restaurant sales dollar goes, 2024 medians

Per cent of sales. Food and labour figures are published medians; "all other costs" is the residual.



One percentage point of movement on the food cost ratio equals **36% of the entire pre-tax margin.** Limited-service operators run a 4.0% median margin on the same arithmetic.

Figure 1 — The full-service sales dollar, 2024 medians. Food and beverage (32.0%), salaries and wages (36.5%) and income before taxes (2.8%) are published medians from the National Restaurant Association's 2024 operator data.[1,2] "All other costs" at 28.7% is the residual and is AUTHOR'S CALCULATION; it is not a published figure, and because the three published medians come from separate distributions the residual should be read as illustrative rather than as a line item.

Where profitable and unprofitable operators actually diverge

The most instructive single comparison in the operator data is not the margin itself but the labour line beneath it. Profitable full-service operators held salaries and wages to a median **34.2 per cent** of sales. Unprofitable full-service operators ran **42.9 per cent**.[2] In limited-service the equivalent split is 30.0 per cent against 34.1 per cent.

2024 medians, % of sales	Full-service, all	FSR profitable	FSR unprofitable	Limited-service, all
Food & non-alcohol beverage cost	32.0%	—	—	32.4%
Salaries & wages incl. benefits	36.5%	34.2%	42.9%	31.7%
Income before taxes	2.8%	—	—	4.0%
Prime cost (food, beverage, labour)	—	—	—	~65%

Source: National Restaurant Association, *2025 Restaurant Operations Data Abstract* (2024 data, n > 900 operators) and the Association's accompanying analysis commentary.[1,2,16] Em-dashes indicate figures not published in that breakdown, not zero values.

An 8.7-point gap on the largest cost line is the difference between a going concern and a closing one. It is also the line most directly exposed to how orders are taken. The National Restaurant Association reports 73 per cent of operators saying their restaurant is more efficient and productive than before the pandemic, with 41 per cent having used technology to enhance kitchen productivity.[17]

SCALE, FOR CONTEXT

The Association forecasts US restaurant industry sales of approximately **$1.55 trillion** in 2026, with real inflation-adjusted gains of 1.3 per cent, and operators adding roughly 100,000 jobs to reach total industry employment of 15.8 million. It also reports that 26 per cent of operators are now using artificial-intelligence-related tools, and that six in ten plan to invest more in technology to enhance the customer experience.[18]

SECTION 04

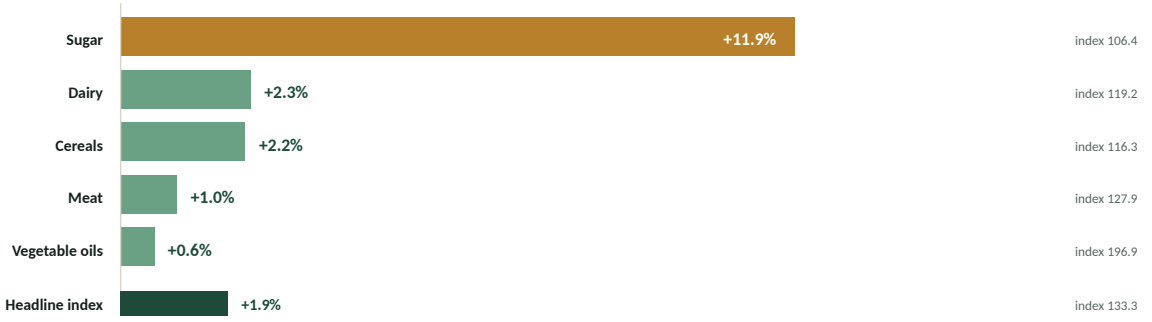
Input-cost volatility and repricing latency

The real cost of a printed menu is not printing. It is the gap between the day an input cost moves and the day the price on the page can follow.

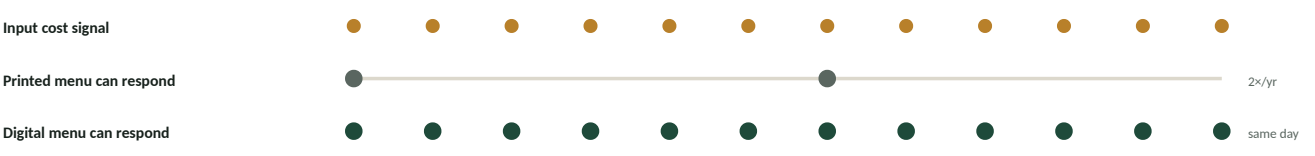
In August 2026 the FAO Food Price Index averaged **133.3 points**, up 2.5 points (1.9 per cent) on July and 3.3 points (2.5 per cent) year on year, while remaining 26.9 points (16.8 per cent) below its March 2022 peak.[3] OFFICIAL The headline index is stable. The components are not: the sugar sub-index rose **11.9 per cent in a single month**, driven by "growing concerns over the global sugar supply outlook in the 2026/27 season."

Month-on-month movement, FAO Food Price Index components, August 2026

Per cent change on July 2026. Index level shown at right. A stable headline conceals component volatility.



REPRICING LATENCY — THE SAME TWELVE MONTHS, THREE RESPONSE SPEEDS



On a twice-yearly reprint cycle, the average unrecovered lag on an affected item is three months.

Figure 2 — Component volatility and repricing latency. Index values and month-on-month changes: FAO Food Price Index, August 2026, released 4 September 2026.[3] The lower panel is a CONCEPTUAL ILLUSTRATION of response cadence, not measured data; the three-month average lag is the arithmetic mean lag of a semi-annual repricing cycle.

The annual picture across four markets

Measure	Rate	Period	Source
US food away from home, CPI	+3.4%	12 months to Aug 2026	US Bureau of Labor Statistics[5]
US full-service meals, CPI	+3.5%	12 months to Aug 2026	US Bureau of Labor Statistics[5]
US limited-service meals, CPI	+3.2%	12 months to Aug 2026	US Bureau of Labor Statistics[5]
US food away from home, forecast	+3.6%	2026 (interval 3.2–3.9%)	USDA Economic Research Service[4]
US food away from home, 20-year average	+3.5%/yr	long run	USDA Economic Research Service[4]
Euro area annual inflation	+2.9%	July 2026	Eurostat[19]
Euro area services inflation	+3.3%	July 2026	Eurostat[19]
Türkiye restaurants & accommodation, CPI	+31.16%	12 months to Aug 2026	TÜİK, via secondary reporting[20]
Türkiye food & non-alcoholic beverages, CPI	+33.79%	12 months to Aug 2026	TÜİK, via secondary reporting[20]

The two Türkiye figures are government data reached through independent secondary sources; TÜİK's own portal is JavaScript-gated and was not read directly. They are the two figures in this report we would most want a reader to re-verify at source before relying on them (§12, gap 8).

WHAT WE ARE NOT CLAIMING

We are not claiming a printing cost, because no independent source publishes one (§1, §12). We are not claiming that a digital menu automatically improves margin, because changing prices faster only helps an operator who actually changes them. The claim is narrower and defensible: **a printed menu imposes a structural lag between input cost movement and price response, and at a 2.8 per cent median margin that lag is expensive in a way that is arithmetically obvious.** Whether an operator captures the difference depends on what they do with the capability, not on owning it.

SECTION 05

What the evidence says about menu design

Menu design has an unusually large body of genuine experimental research behind it, and an unusually large body of confident advice that contradicts it.

Price presentation

Cornell researchers ran a field study at a working restaurant with 201 diners, comparing three price formats: numerals with a dollar sign, numerals alone, and prices written out in words. Diners given **numeral-only prices spent approximately 8 per cent more** — an average of $5.55 more per person.[6] PEER-REVIEWED The result was counterintuitive: there was no difference between the dollar-sign and written-out formats, and the effect appeared only when the currency symbol was removed entirely. Sheryl Kimes's explanation is that "references to dollars, in words or symbol, reminds people of the 'pain of paying'."

A related Cornell study of 318 participants found restaurants using service charges or service-inclusive pricing were rated *more* expensive than those relying on tips, because "participants were generally using menu prices — and not the total bill — as their guide."[21] Perceived expensiveness is anchored on the number printed next to the dish, not on what the guest eventually pays.

Item position

Dayan and Bar-Hillel, publishing in *Judgment and Decision Making*, found menu items "placed at the beginning or the end of the list of their category options were up to **twice as popular** as when they were placed in the center of the list."[7] The measured effect was a ten percentage point swing — 45 per cent when centred against 55 per cent at the edges — replicated in both laboratory (240 participants) and field conditions (459 orders on the baseline menu against 492 on the manipulated menu, across 30 study days).

The "sweet spot" that is not there

For decades the industry convention has been to place high-margin items above the midline on the right-hand page, in a supposed visual sweet spot. An infrared eye-tracking study found **no evidence of one**. Diners read menus sequentially, like a book, left to right and down the page. The study did identify a low-attention "sour spot" — which contained, in the menu tested, the restaurant information and a list of salads.[8]

This is the most commercially significant finding in the menu-design literature, and the one least reflected in practice. Sequential reading means *order* governs attention, which is precisely the variable Dayan and Bar-Hillel measured — and precisely the variable a digital menu can change without a reprint.

Photographs — the conditional finding

Hou, Yang and Sun, in the *International Journal of Hospitality Management*, tested whether pictures help. Their answer is *it depends on the dish name*: for **common, descriptive** food names, adding pictures had a positive effect on attitudes toward the item, willingness to pay and purchase intentions. For **ambiguously named** dishes, pictures helped only "verbalizers" — and "visualizers exhibit less favorable attitudes and behavioral outcomes after viewing ambiguously-named dishes with pictures than those without pictures."[13] PEER-REVIEWED

Photographing everything is therefore not the implication. Photographing dishes whose names already describe them is. Photographing a dish with an invented or opaque name may make it perform worse with part of the audience than no photograph at all.

The menu engineering framework

The classification restaurants still use originates with Kasavana and Smith's *Menu Engineering: A Practical Guide to Menu Analysis*, published in 1982.[22] Taylor and Brown's review sets out the model: items are plotted on individual contribution margin against sales volume, producing four quadrants, with the

high/low popularity dividing line set at **70 per cent of average units sold**.[23]

The menu engineering matrix — and what the design evidence says to do in each quadrant

Kasavana & Smith (1982). Actions are this report's synthesis of the cited design findings, not part of the original model.

The original model classifies. It does not say what to do next — the actions above come from the experimental design literature in this section.

Figure 3 — The menu engineering matrix with evidence-derived actions. Framework: Kasavana & Smith (1982),[22] as set out in Taylor & Brown's review including the 70 per cent dividing line.[23] Quadrant actions are this report's synthesis of the price-format,[6] position[7] and photograph[13] findings cited in this section; they are not part of the original model and should be tested, not assumed.

Choice overload — a contested finding, presented contested

Shortening menus is standard advice, usually citing Iyengar and Lepper's finding that people are "more likely to purchase exotic jams or gourmet chocolates… when offered a limited array of 6 choices rather than an extensive array of 24 or 30 choices."[24] The advice is less settled than it sounds.

A meta-analysis of 63 experimental conditions drawn from 50 studies and 5,036 participants found a mean effect size of **D = 0.02** — effectively zero — concluding that choice overload is not a robust main effect.[25] A later meta-analysis of 99 observations (N = 7,202) found the effect significant *once four moderators are accounted for*: choice set complexity, decision task difficulty, preference uncertainty, and decision goal.[26]

The defensible position is the second one: choice overload is conditional, not automatic. An operator told simply to "cut the menu" is being given advice that the strongest available evidence supports only under specific conditions — which is an argument for measuring what happens on your own menu, not for a rule of thumb.

SECTION 06

Digital ordering and spend

There is one robust, large-sample, peer-reviewed finding on digital ordering and spending. There is also a large and specific hole in the literature next to it, and this section states both.

Abell, Biswas and Arroyo Mera, publishing in the *Journal of the Academy of Marketing Science*, found that "a digital (vs. non-digital) ordering mode leads consumers to have a more automatic decision making mode and lower cognitive involvement, which results in more indulgent outcomes in the

form of unhealthy food orders and higher overall spending."[9] PEER-REVIEWED The research reviewed more than **23,000 orders** across six studies conducted at restaurants and two in a university laboratory, at sites including an independently owned restaurant and "a major global dining chain with 1,000 locations across 23 countries."[10]

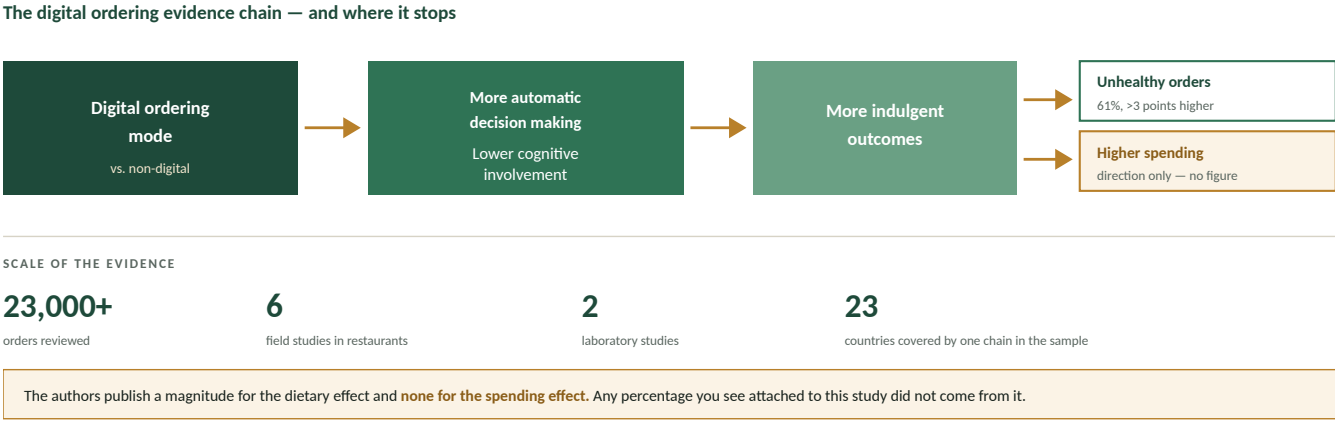


Figure 4 — The digital ordering evidence chain. Mechanism and outcomes: Abell, Biswas & Arroyo Mera, *Journal of the Academy of Marketing Science* 52, 2024;[9] scale and the 61 per cent figure from the University of South Florida's account of its own study.[10] Note that this research covers digital ordering modes generally — kiosks, tablets, apps — and is not specific to QR menus.

Tabletop technology — directional, not quantified

Cornell's Center for Hospitality Research studied tabletop ordering hardware across two studies at a full-service casual dining chain. "Dining time was significantly reduced among patrons who used the tabletop hardware to order or pay for their meals, as was the time required for servers to meet the needs of customers. Also, those who used the devices to order a meal tended to spend more than those who did not."[27] INSTITUTIONAL The magnitudes — minutes saved, dollars added — are not published in any publicly accessible version, so this report cites the direction only. The same researcher has noted that "about 20 per cent of restaurant guests want nothing to do with these pads."[28]

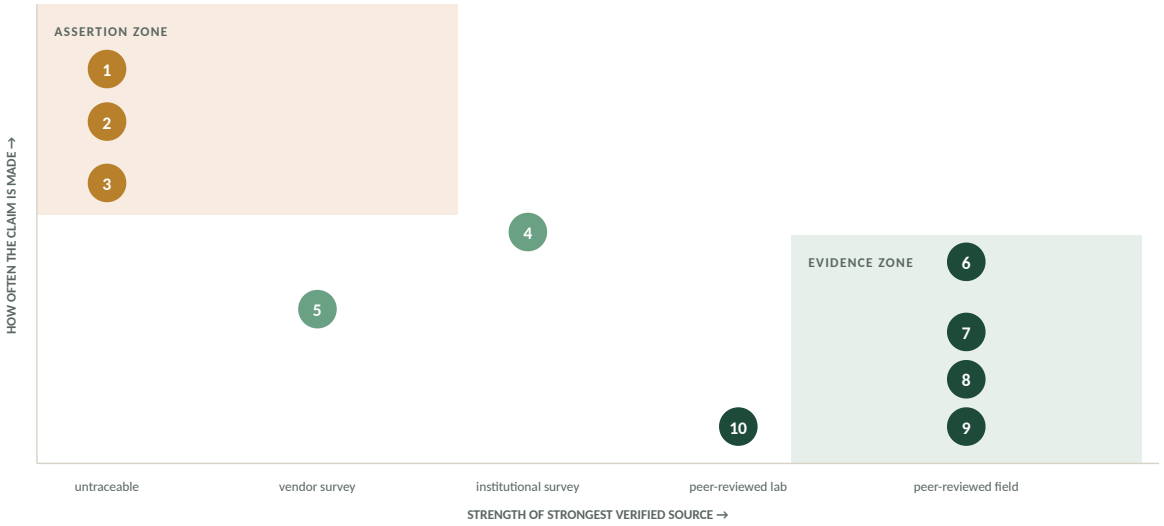
A documented operational case

The National Restaurant Association reports that more than 125,000 First Watch customers used the chain's QR-code mobile payment feature in a single week, which — on the stated assumption of 30 seconds saved per transaction at the register — the Association puts at roughly **1,000 combined customer and employee hours** saved in that week across 420 locations.[17] This is an operator case study relayed by an association, not an independent measurement, and the underlying saving is assumed rather than observed. It is included because it is the most concrete published operational figure we found, and labelled so readers can weight it accordingly.

Where the literature stops

How often a claim is made, against how well it is evidenced

Vertical: how frequently the claim appears in trade commentary. Horizontal: the strongest source this report could verify.



1 "Menu photos increase sales by 30%" — no primary study exists
2 "QR menus lift average order value by 28%" — no study measures this
3 "Printed menus cost ~$1,200 a year" — traces only to vendors
4 59% of diners would open a menu by QR — NRA, sample size undisclosed
5 47% are uncomfortable using QR codes — bank survey, sample undisclosed
6 Digital ordering raises spending — JAMS, 23,000+ orders
7 Numeral-only prices raise spend ~8% — Cornell field study, n=201
8 Edge positions up to 2× as popular — lab n=240, field n=492
9 Photos help only descriptively named dishes — IJHM
10 QR menus reduce customer loyalty — IJHTM, two studies

Figure 5 — Claim frequency against evidence strength. Horizontal placement reflects the strongest source this report was able to verify for each statement; vertical placement is the authors' qualitative assessment of how often the claim appears in trade commentary and is not a measured quantity. The pattern is the point: the three most repeated claims in this category sit at the left edge, and the best-evidenced findings are the ones least often repeated.

THE GAP, STATED PLAINLY

We found **no peer-reviewed study measuring the effect of QR menus specifically on average order value, order accuracy, table turnover or labour efficiency.** The QR-specific academic literature is dominated by technology-acceptance survey work measuring *intentions* rather than behaviour, plus one study finding a negative loyalty effect (§7). Any document that quotes a QR-specific uplift percentage is quoting something that, as far as we can establish, has not been measured.

SECTION 07

Consumer readiness and resistance

Roughly six in ten diners say they would open a menu by QR code. Roughly half say they are not comfortable doing so. Both numbers are real, they are not contradictory, and a deployment that ignores the second one will underperform.

The National Restaurant Association's *Restaurant Technology Landscape Report 2024* reports that **59 per cent of full-service customers** say they would pull up a menu on their smartphone using a QR code, with 48 per cent comfortable ordering that way and 46 per cent paying. For limited-service the figures are 57, 52 and 48 per cent.[17] INSTITUTIONAL Baby boomers were least likely to use QR codes across every measure. The report does not disclose its sample size, survey dates or margin of error, and that should temper how precisely these numbers are read.

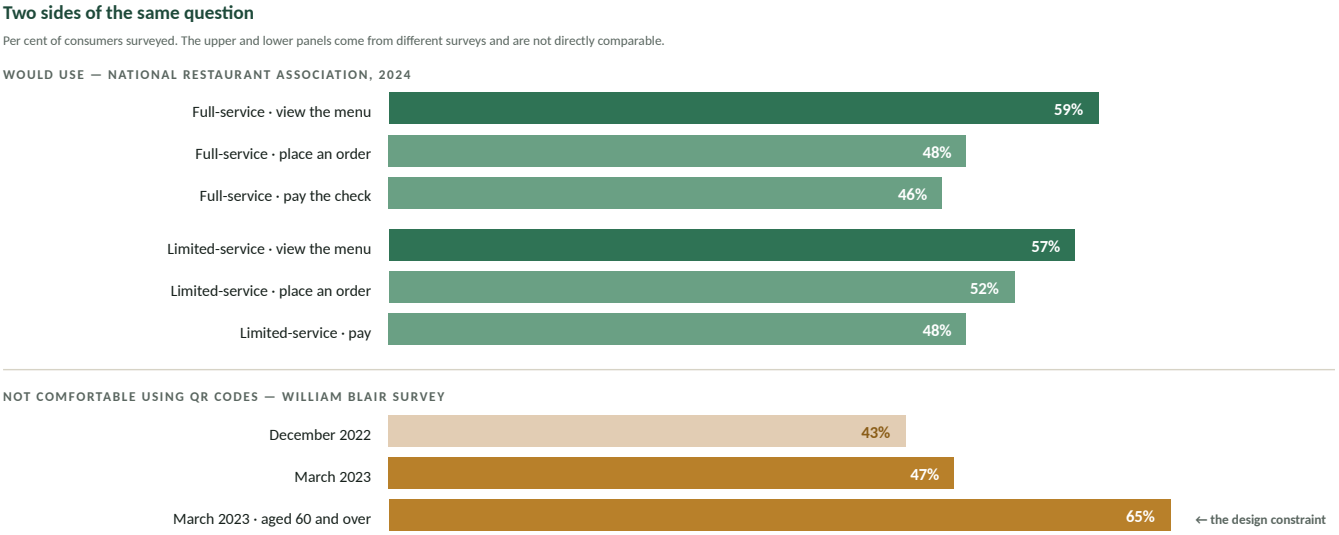


Figure 6 — Willingness and discomfort. Upper panel: National Restaurant Association, *Restaurant Technology Landscape Report 2024*; sample size not disclosed.[17] Lower panel: William Blair consumer survey as reported by Restaurant Dive, fielded December 2022 and March 2023; sample size not disclosed and the publisher is an investment bank, not a research institute.[12] REPORTED Neither survey discloses methodology in enough detail to support precise comparison; they are shown together to establish that both dispositions exist at scale.

The counter-evidence that belongs in every deployment decision

Urumutta Hewage, Boman and Lefebvre, in the *Journal of Hospitality and Tourism Management*, found across two studies that "QR code menus **diminish customer loyalty** (compared to traditional menus) due to perceived inconvenience," with the effect moderated by customers' need for interaction.[11] PEER-REVIEWED The repository record does not disclose sample sizes.

This is the single most important counter-citation for anyone considering a QR menu, and the mechanism it identifies — *perceived inconvenience*, moderated by *need for interaction* — is actionable rather than fatal. It says the risk concentrates in guests who want human contact and in deployments that make the menu harder to reach. A specification that preserves a physical option, loads fast, requires no app and no account, and keeps staff interaction intact addresses the identified mechanism directly. A specification that removes printed menus entirely does not.

Work in the *British Food Journal* using PLS-SEM on 200 respondents with prior QR menu experience found performance expectancy, effort expectancy, social influence, habit and perceived privacy protection all significantly positive for intention to use, while facilitating conditions, hedonic motivation and perceived privacy risk had no significant effect.[29] Effort expectancy mattering is consistent with the loyalty finding: friction is the variable.

Where consumers prefer to transact

Deloitte's consumer research found **40 per cent** of customers prefer to order directly through a restaurant's own app or website against only **13 per cent** preferring third-party apps, and that consumers aged 18 to 38 were 16 percentage points more likely to return to restaurants using automation (58 per

cent against 42 per cent).[30] INSTITUTIONAL Deloitte's public material contains no QR-menu-specific figure.

For completeness: the National Restaurant Association's 2024 report also finds 65 per cent of limited-service customers would order via a self-service kiosk and 63 per cent would pay that way; 65 per cent of full-service customers would use a tableside tablet to pay and 60 per cent to order — falling to 47 and 36 per cent respectively among baby boomers.[17] The age gradient is consistent across every digital touchpoint measured.

SECTION 08

Operations: turnover, RevPASH and capacity

The largest quantified operational upside in the hospitality research literature is not about menus at all. It is about capacity — and it is measured at 15 per cent.

Restaurant revenue management has a defined metric. Kimes, Chase, Choi, Lee and Ngonzi introduced **RevPASH** — revenue per available seat-hour — in the *Cornell Hotel and Restaurant Administration Quarterly*, arguing that it "integrates the duration of the meal as a factor in the revenue calculation" and that restaurants should measure it rather than contribution margin or revenue per day part.[31] PEER-REVIEWED The metric matters because it makes explicit that a restaurant sells time as well as food.

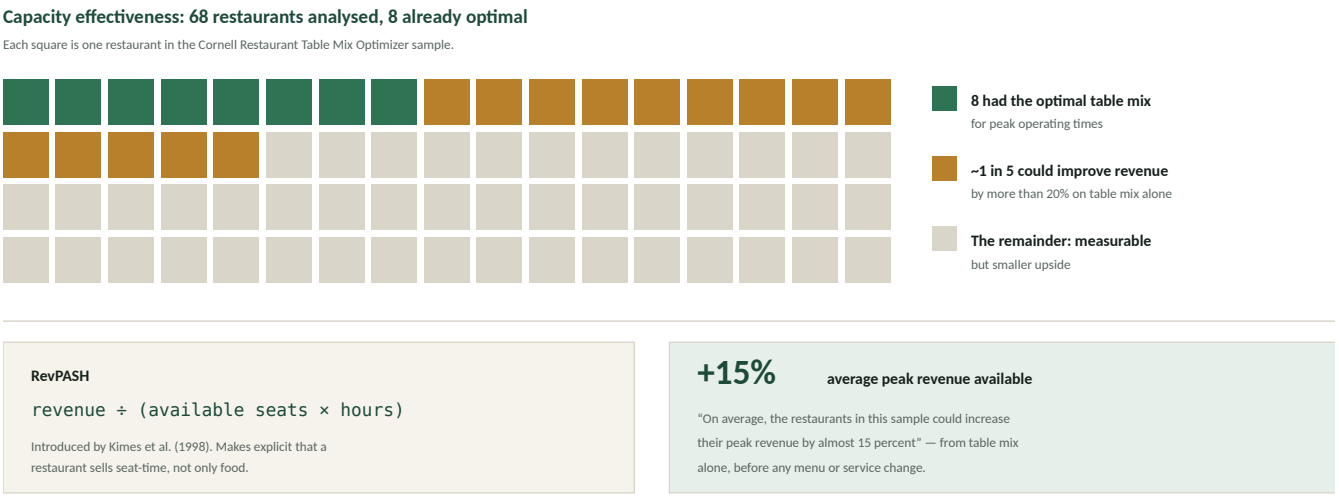


Figure 7 — Capacity effectiveness and RevPASH. Table-mix findings: Gary M. Thompson, "Restaurant Capacity Effectiveness: Leaving Money on the Tables", Center for Hospitality Research, Cornell University, 2007.[32] RevPASH definition: Kimes, Chase, Choi, Lee & Ngonzi (1998).[31] The unit chart shows the published counts; the placement of individual squares is illustrative.

Thompson's finding deserves emphasis because it is unusually well quantified and unusually under-acted-upon: of 68 restaurants analysed, only **eight** had the optimal table mix for peak operating times. "On average, the restaurants in this sample could increase their peak revenue by almost 15 per cent," and "almost one-fifth of the restaurants in this sample could improve revenue by more than 20 per cent just by having the appropriate mix of right-size tables."[32]

Kimes and Robson analysed more than fourteen hundred meal transactions at a 210-seat casual restaurant and introduced **spending per minute** as the operational combination of duration and average check. Their result is counterintuitive: spending per minute at booths was slightly above average and at banquette tables below it, and "tables in poor locations in the dining room generated SPM values higher than supposedly good tables."[33]

WHY THIS SECTION IS IN A REPORT ABOUT MENUS

Because it establishes where the measurable operational money actually is, and it is not where menu-technology marketing usually points. The published upside from table mix is 15 per cent of peak revenue with a named methodology behind it. The published upside from QR menus specifically is, as §6 and §12 record, unmeasured. An operator with both problems should fix the measured one first. What a digital menu contributes to this picture is *the data* — view-to-order ratios, time-on-item, category sequence — that makes turnover and mix analysis possible at all without a manual study.

SECTION 09

Compliance and single-source menu data

Four jurisdictions now require the same dish-level information to appear correctly in several places at once. Maintaining that by hand, across a printed menu and a delivery app, is a reconciliation problem before it is a design problem.

Under Regulation (EU) No 1169/2011, Article 9(1)(c) requires declaration of "any ingredient or processing aid listed in Annex II or derived from a substance or product listed in Annex II causing allergies or intolerances used in the manufacture or preparation of a food and still present in the finished product, even if in an altered form."[34] OFFICIAL Annex II lists exactly **fourteen** substances: cereals containing gluten, crustaceans, eggs, fish, peanuts, soybeans, milk, nuts, celery, mustard, sesame, sulphur dioxide and sulphites above 10 mg/kg or 10 mg/litre, lupin and molluscs — each "and products thereof."[35]

For non-prepacked food, including food offered by mass caterers, **only allergen information is mandatory**; other Article 9(1) particulars are optional unless a member state requires them. Member states may also adopt national measures concerning the means through which the particulars are expressed and presented.[36] That latitude is the legal basis for digital allergen disclosure — but implementations differ by country, so operators should verify per jurisdiction rather than relying on a general statement, including this one.

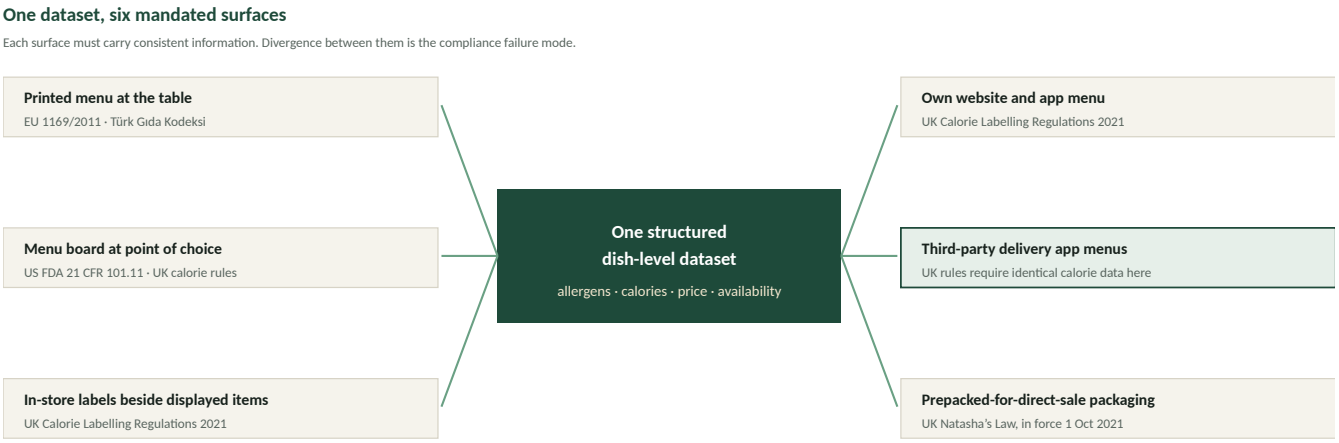


Figure 8 — One dataset, six mandated surfaces. Sources: EUR-Lex Regulation (EU) No 1169/2011 and its Annex II;[34,35] European Commission guidance on non-prepacked food;[36] UK SI 2019/1218;[37] UK Calorie Labelling (Out of Home Sector) (England) Regulations 2021 implementation guidance;[38] US FDA menu labelling requirements;[39] T.C. Tarım ve Orman Bakanlığı on allergen declaration in mass-consumption venues.[40] Which surfaces apply depends on jurisdiction and business size; this figure shows the union, not a universal obligation.

The requirement that makes the case

The UK's *Calorie Labelling (Out of Home Sector) (England) Regulations* 2021, in force since 6 April 2022, apply to any business with 250 or more employees offering non-prepacked food for immediate consumption. Energy must be displayed in kilocalories with the statement "adults need around 2000 kcal a day" and a portion-size reference, at the **point of choice** — on menus and menu boards, **on online menus and third-party delivery app menus**, on labels next to displayed items, and on packaging — positioned "clearly and prominently," "easily visible" and "clearly legible," matching the styling of food descriptions and prices.[38] OFFICIAL

That is the single most directly citable regulatory argument for single-source menu data in this report. An operator subject to those rules must keep identical calorie information synchronised across a physical menu, their own online ordering channel, and every third-party delivery platform they appear on. Doing that from separate systems is a manual reconciliation task repeated at every price or recipe change; doing it from one dataset is a publishing step.

In Türkiye, the *Türk Gıda Kodeksi Gıda Etiketleme ve Tüketicileri Bilgilendirme Yönetmeliği* of 26 January 2017, aligned with EU Regulation 1169/2011, has since **1 January 2020** required mass-consumption venues — restaurants, canteens, schools, hospitals — to declare the same fourteen allergens, communicated through "posters, writing boards, or menus."[40] The regulation explicitly names the menu itself as a compliant disclosure channel.

The US FDA rule is narrower in scope but stricter in specification: restaurants and similar retail food establishments that are part of a chain with **20 or more locations** doing business under the same name and offering substantially the same menu items must disclose calories on menus and menu boards, plus a statement that written nutrition information is available on request and that "2,000 calories a day is used for general nutrition advice, but calorie needs vary." On request they must supply total calories, total fat, saturated fat, trans fat, cholesterol, sodium, total carbohydrates, sugars, fibre and protein. Compliance has been required since 7 May 2018.[39]

SECTION 10

Multilingual demand

Türkiye's three largest inbound markets speak three different languages, and none of them is Turkish. In a tourist-facing restaurant this is not a nicety; it is the majority of the addressable market.

Türkiye welcomed a record **52.78 million foreign tourists** in 2025, with total visitors rising 2.7 per cent to an all-time high of 63.94 million. Tourism revenues increased 6.8 per cent to US$65.23 billion, and average spending per visitor rose 3.7 per cent to **US$1,008**.[41] OFFICIAL

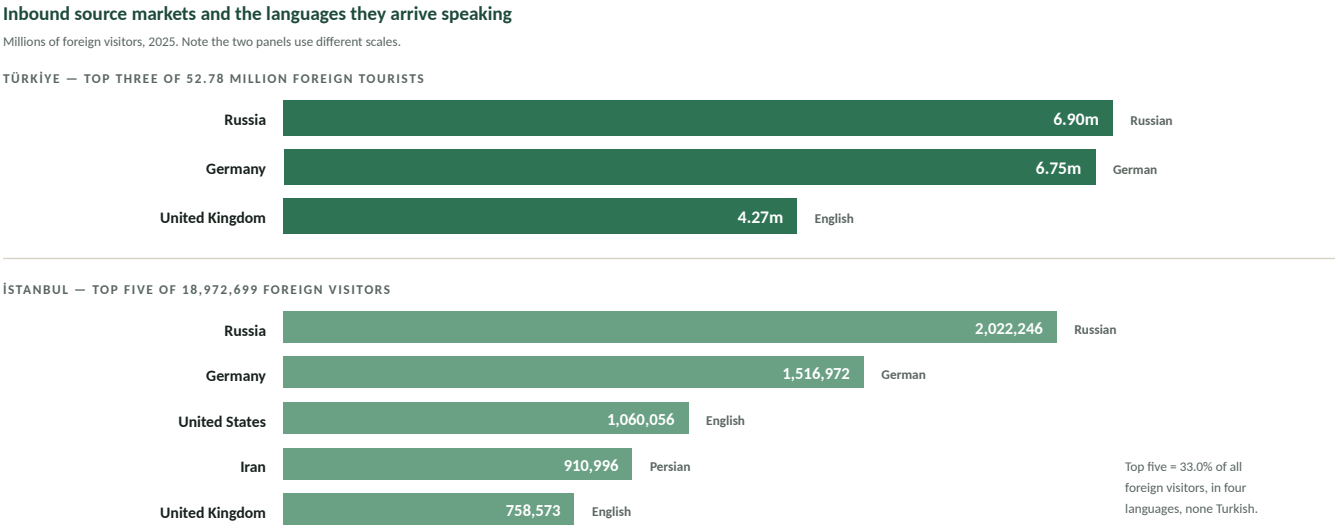


Figure 9 — Source markets and languages. Türkiye national figures: Ministry of Culture and Tourism and TurkStat data, reported by two independent outlets.[41] Istanbul figures: İstanbul İl Kültür ve Turizm Müdürlüğü, December 2025 bulletin.[42] The 33.0 per cent share is AUTHOR'S CALCULATION. "Principal language" is descriptive context, not a source claim, and says nothing about any individual visitor's second languages.

The operational implication is narrow and concrete. A restaurant serving this market needs its dish names, descriptions and — critically — its allergen declarations to be readable by guests whose first language is Russian, German, English or Persian. A printed menu can carry two languages legibly and perhaps three. Beyond that, either the typography degrades or the menu becomes a booklet, and each additional language multiplies the reprint cost and the repricing latency established in §4.

There is also a research connection worth drawing. Hou, Yang and Sun found that pictures help for *descriptively named* dishes and can backfire for ambiguous ones (§5).[13] A translated Turkish dish name is, to a foreign guest, very often an ambiguous name. That makes the pairing of a good translation with an image a stronger intervention than either on its own — and makes an untranslated name with a photograph the case the research specifically warns about.

SECTION 11

A deployment specification

Every criterion below traces to a finding in sections 3 to 10. Three of them exist specifically to address evidence that cuts against digital menus, which is why they are in the

specification rather than in a footnote.

Ten criteria for a digital menu deployment

Each criterion names the section and source from which it follows. Criteria 8, 9 and 10 answer the counter-evidence directly.

1	**Allergen data held as structured fields per dish, not free text**	EU Reg. 1169/2011 lists 14; Türk Gıda Kodeksi requires the same since 1 Jan 2020 — §9
2	**One dataset publishing to every surface the business uses**	UK calorie rules require identical data on menus, own online channels and delivery apps — §9
3	**Price editable per item, same day, without a production cycle**	Component input costs move monthly; a twice-yearly reprint carries a three-month average lag — §4
4	**Prices rendered as numerals, without a currency symbol**	Cornell field study, n=201: numeral-only prices, ~8% higher spend, +$5.55 per person — §5
5	**Category order controllable; target items at list edges**	Edge positions up to 2× as popular; eye-tracking shows sequential reading, no "sweet spot" — §5
6	**Photographs attached selectively, to descriptively named dishes**	Pictures help descriptively named dishes and can backfire on ambiguous ones — §5, IJHM
7	**Dish names, descriptions and allergen terms in the guest's language**	Türkiye's top three inbound markets speak three languages, none of them Turkish — §10
8	**A physical menu retained; no app, no account, fast load**	QR menus reduce loyalty via perceived inconvenience; 47% are uncomfortable using them — §7
9	**Legible at large type sizes and on older devices**	Every digital touchpoint measured shows an age gradient; 65% discomfort among the over-60s — §7
10	**Per-item view-to-order data available to the operator**	Menu engineering and RevPASH analysis both require mix data the paper menu cannot produce — §8

Criteria 1–3 are compliance and cost control. Criteria 4–7 are the design evidence applied. Criteria 8–10 exist because of findings that cut against QR menus.

A deployment that removes the printed menu entirely fails criterion 8, and the research says what that costs: loyalty, concentrated among guests who want human interaction.
None of these criteria requires a particular vendor. Several can be met with a well-built static page.

Figure 10 — Evidence-derived deployment specification. Authors' synthesis of the findings in sections 4–10. Each criterion cites the section and underlying source from which it follows.

Two observations about this list. First, it contains no feature that only a paid platform can supply: criteria 4, 5, 6 and 9 are editorial decisions, and criteria 1, 3 and 7 can be met by a competent static site with disciplined maintenance. What platforms supply is the maintenance discipline itself, at the point where the number of dishes multiplied by the number of languages multiplied by the number of surfaces exceeds what one person can reconcile by hand.

Second, the specification will fail for an operator who deploys it and stops. The digital ordering research measures what happens when guests order through a screen; the menu-design research measures what happens when specific choices are made about format and order; the capacity research measures what happens when table mix is analysed. None of it measures the effect of owning software. Criterion 10 exists to generate the data that makes the rest actionable, and it is the one most often switched on and never looked at.

SECTION 12

Limitations and data gaps

Twelve things this report could not establish. Several concern the publisher's own product category.

1. **No peer-reviewed study measures QR menu effects on average order value, order accuracy, table turnover or labour efficiency.** This is the central gap. The QR-specific literature is dominated by technology-acceptance survey work measuring intentions rather than behaviour, plus one study finding a negative loyalty effect.[11,29] The nearest rigorous evidence covers

digital ordering modes generally and reports direction without magnitude.[9]

2. **No independent source publishes a menu printing or reprint cost.** Every figure in circulation traces to companies selling digital menus. A commercial menu printer with the opposite incentive publishes no per-unit pricing at all. This report makes no print-cost claim.
3. **"Menu photographs increase sales by 30 per cent" has no primary source.** Every instance traced resolves to a marketing article citing another marketing article. The genuine finding is Hou, Yang and Sun's conditional result.[13]
4. **No US operator-side QR menu adoption rate is published.** The National Restaurant Association's 2022, 2024, 2025 and 2026 publications give consumer willingness figures but no operator adoption percentage for QR menus specifically. A widely repeated claim that "half of all full-service restaurant operators in the United States" have added QR menus appears in a peer-reviewed journal, but in a literature-based teaching case with no primary data collection, and we could not trace it to an underlying survey.[43] Do not treat it as measured.
5. **Iyengar and Lepper's jam-study percentages could not be verified from a primary source.** The citation, journal, pages and abstract are confirmed from Columbia Business School's own listing, but the booth-level stopping and purchase rates commonly quoted as "3 per cent versus 30 per cent" were not. This report quotes the abstract wording only.[24]
6. **Susskind and Curry's tabletop-technology magnitudes are not published.** The abstract states dining time "was significantly reduced" and diners "tended to spend more"; no minutes or dollars appear in any accessible version. Cited as directional only.[27]
7. **Two heavily used survey sources do not disclose their methodology.** The National Restaurant Association's *Restaurant Technology Landscape Report* 2024 publishes no sample size, survey dates or margin of error.[17] The William Blair consumer survey publishes no sample size and its publisher is an investment bank.[12] Both are used in §7 and both are labelled there.
8. **TÜİK's data portal is JavaScript-gated** and was not read directly. The two Turkish CPI figures in §4 are government data reached through independent secondary sources and are internally consistent, but should be re-verified against the TÜİK bulletin before being relied on.[20]
9. **Statista's measurement of US diner QR menu usage is paywalled.** The metadata is visible (survey June 2023, n = 11,680 US adults 18+, published 31 January 2024) and the headline reports an equal share of diners using QR and paper menus in 2023, but the percentage itself is behind a paywall.[44] It would be the best available consumer-side usage figure; we could not obtain it.
10. **A relevant counterpoint on menu layout could not be retrieved.** Kincaid and Corsun's "Are consultants blowing smoke? An empirical test of the impact of menu layout on item sales" (*IJCHM* 15(4), 2003) is confirmed by citation but its findings were not accessible; the publisher's pages are CAPTCHA-gated.[45] Given the title it very likely reports a null or weak result on menu layout, and would sit alongside the eye-tracking work in §5.
11. **One widely cited study was excluded on integrity grounds.** The 2001 finding that descriptive menu labels increased sales by 27 per cent is excluded because its lead author was subsequently found by his university to have committed academic misconduct in his research and scholarship.[14] The paper itself carried no retraction notice when we checked. Readers will encounter the figure elsewhere.
12. **Cost and margin data are United States-centric, and sustainability claims are omitted entirely.** US margin structures should not be assumed to transfer to markets with different labour law, tipping norms or tax treatment. On paper's environmental footprint, the best intergovernmental source we located dates from the 1990s and documents dramatic improvement in mill efficiency — which arguably cuts against an anti-paper argument rather than for it. We therefore make no sustainability claim in this report.

WHAT THE GAPS MEAN FOR THE ARGUMENT

Items 1, 2, 3 and 4 remove the four numbers most commonly used to sell digital menus. The argument in this report survives them because it never rested on them. It rests on published operator margins (§3), published commodity and consumer price data (§4), the experimental menu-design literature (§5), a 23,000-order study of digital ordering (§6), published capacity research (§8), and the text of four sets of regulations (§9). Those are the parts that will still be true next year.

SECTION 13

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APPENDIX

Implementation resources

The resources below are QRMenu.link's own published material, listed against the section and specification criterion each relates to. They are the publisher's operational and editorial material, not research sources; nothing in sections 3 to 12 is cited to any of them.

SEE THE SPECIFICATION WORKING — §11

Live demonstration menu
qrmenu.link/menu/demo/

Platform overview, features and pricing
qrmenu.link

Step-by-step deployment guide
qrmenu.link/blog/en/restoraninizda-dijital-menu-kullanmaya-baslama-rehberi-adim-adim.html

ALLERGENS AND COMPLIANCE — §9, CRITERION 1

Allergen labelling and correct icon use for foreign customers
qrmenu.link/blog/en/yabanci-musteriler-icin-menude-alerjen-isaretlemesi-ve-dogru.html

PRICING AND REPRICING — §4, §5, CRITERIA 3 AND 4

Psychological traps in menu pricing: the currency symbol and ascending order
qrmenu.link/blog/en/menude-fiyat-yazarken-psikolojik-tuzaklar-dolar-isareti-ve.html

How to revise prices in seasonal menus
qrmenu.link/blog/en/sezonluk-menulerde-fiyat-revizyonu-nasil-yapilir.html

Seasonal pricing strategy in tourist areas
qrmenu.link/blog/en/turistik-bolgelerde-sezonluk-fiyatlandirma-stratejileri-ile-k-r.html

MENU ENGINEERING — §5, FIGURE 3

Menu engineering: analysing your menu to raise profit margins
qrmenu.link/blog/en/menu-muhendisligi-k-r-marjlarinizi-artirmak-icin-menunuzu.html

Product profitability analysis: identifying dishes to remove
qrmenu.link/blog/en/restoraninizda-urun-k-rliligi-analizi-ile-menuden-cikarmasi.html

Highlighting high-margin items
qrmenu.link/blog/en/menu-muhendisligi-k-r-marji-yuksek-urunlerinizi-one.html

MULTILINGUAL SERVICE — §10, CRITERION 7

Cultural adaptation and flavour description in menu translation
qrmenu.link/blog/en/yabanci-musteriler-icin-menu-cevirisinde-kulturel-uyum-ve.html

Icon-led menu design: overcoming the language barrier
qrmenu.link/blog/en/yabanci-musteriler-icin-ikonlu-menu-tasarimi-dil-engeli.html

ACCESSIBILITY AND ANALYTICS — §7, §8, CRITERIA 9 AND 10

Readable menu design for older guests
qrmenu.link/blog/en/restoraninizda-yasli-misafirler-icin-okunabilir-menu-tasarimi.html

Analysing customer behaviour data from a QR menu
qrmenu.link/blog/en/qr-menu-ile-musteri-davranis-verilerini-analiz-etme.html

Service speed at peak hours through visitor flow analysis
qrmenu.link/blog/en/restoraninizda-ziyaretci-akisi-analizi-ile-yogun-saatlerde-servis.html

REUSE, CITATION AND CORRECTIONS

 Suggested citation: *The Digital Dining Shift: Menu Evidence, Digital Ordering and Restaurant Margin, 2026*. QRMenu.link, September 2026. Corrections are welcome and will be published — if you can supply a primary source for any item in §12, particularly a peer-reviewed measurement of QR menu effects on order value or turnover, or an independent menu printing cost, we will update this report and credit the correction.