

SUPPLEMENTARY MATERIAL

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Behind the scenes of taste: an exploratory study of non-compliance in Italian artisanal bakery and pastry laboratories

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Summary of the checklist questionnaire for artisanal bakery and pastry laboratories.

This summary highlights the most important questions and activities for each production area and aspect of hygiene management. We have included only the most critical questions for each production area and the percentage of non-conformities score for the overall sector. Each question/check was based on the possibility of answering Yes/No, resulting in a final score for each point, with a higher score for the most important hygienic issues. The demerit value was assigned based on the significance of each question.

Company:

Date of checking and interview:

1) POINT OF SALE

Checking modalities: Visual inspection; interview

- Does the laboratory engage in direct sales to consumers? (Y/N 6 points)
- Is the access area for buyers well delimited? (Y/N 6 points)
- Do buyers come into contact with food? (Y/N 6 points)
- Can buyers access the production line? (Y/N 6 points)
- Can the presence of buyers affect food safety? (Y/N 6 points)
- Is there an access dedicated exclusively to staff entrance? (Y/N 4 points)
- Are the access points for customers and any other exits leading outside closable by one or more entrance doors? (Y/N 2 points)
- Were these doors closed? (Y/N 2 points)
- Are these doors washable and disinfectable? (Y/N 2 points)
- Are the access points equipped with fly control systems or barriers? (Y/N 2 points)
- Excluding those leading outside, are there doors both in the sales area and in any storage areas? (Y/N 1 points); Are they washable and disinfectable? (Y/N 2 points); Do they have handles? (Y/N 1 points); Are any of them recessed? (Y/N 1 points)
- Are the sales and storage areas suitably lined? (Y/N 4 points)
- Are the sales and storage areas suitably floored? (Y/N 4 points)
- Are the sales and storage areas sufficiently ventilated? ((Y/N 3 points)
- Are there artificial light points? (Y/N 1 points); Are they recessed in walls or in the false ceiling or placed in a way to avoid the accumulation of dust? (Y/N 1 points)
- Are the shelves made of smooth and easily cleanable and washable material? (Y/N 3 points)
- Are there openable windows? (Y/N 1 points)
- Are the premises, shelves, and refrigerated counters sufficiently spacious for the amount of goods displayed? (Y/N 3 points)
- Does the store sell bread? (Y/N 1 points); Is it displayed in a compartment separated from other foods (Y/N 2 points); Is it displayed in packaging? (Y/N 10 points)
- Are other bakery products sold in the store? (Y/N 1 points)
- Are they sold only in packaging or pre-packaged? (Y/N 3 points)

Threshold-ranges: Negligible 0-19 points; Low 20-39 points; High 40-59; Unacceptable ≥ 60 points.
Average results: 10.4 score; 6.7% of Laboratories over Low threshold

2) RAW MATERIAL MANAGEMENT

Checking modalities: Visual inspection; interview

- Are the suppliers' technical data sheets available? (Y/N 10 points)
 - Aspects related to technical data sheets: presence of raw material data sheets and values related to CMT (mold and yeast). (If available, enter the data and photocopy)
- Have analyses been performed on the raw materials? Yes/No? Report the results (Y/N 5 points)

Room temperature storage

- Does the company store food products that need to be kept at room temperature as raw materials? (Candied fruits, sugar, flour, raisins, salt, vanilla, etc. Specify which) (Y/N 2 points)
- Is the same path of material used for the entry of raw materials (flour, sugar, eggs/egg products, etc.) and the exit of final products? (Y/N 5 points)
- Are the operations at least separated in time? (Y/N 4 points)
- Is the storage of raw materials conducted in a sufficiently hygienic manner? (Y/N 3 points)
- Are raw materials stored in areas separate from the production areas? (Y/N 7 points)
- Are food products placed on shelves or pallets? (Y/N 3 points)
- Are the shelves or pallets against the walls? (Y/N 5 points) Do they appear rusty and/or with peeling paint? (Y/N 5 points)
- In any case, is there an excessive presence of goods? (Y/N 6 points)
- Are the storage areas sufficiently cool and dry? (Y/N 10 points)

Flour Storage

- In a dedicated room. (0 points)
- In an equipped and designated area of the laboratory. (5 points)
- Near the processing area. (15 points)
- Average storage period of flour (flour resting?), multiply the value based on the weeks (2 X number of weeks)
- Are the packaging materials and containers sufficiently resistant relative to the type of flour stored? (Y/N 10 points)

Refrigerated storage

- Does the company store food products that need to be kept refrigerated as raw materials? (Eggs, egg products, butter, milk, etc. Specify which) (Y/N 2 points)
- Are they actually stored at a temperature not exceeding 4°C (except for those to be used in a very short time)? (Y/N 22 points) Are there refrigerators for this purpose? (Y/N 8 points)
- Are they sufficient for the volume of production? (Y/N 5 points)
- Do they have temperature indicators? (Y/N 5 points)
- Are the foods inside them packaged? (Y/N 3 points)
- Are unpackaged foods kept sufficiently separated to avoid cross-contamination? (Y/N 6 points)
- Are food products placed on shelves or pallets? (Y/N 3 points)
- Are the shelves or pallets against the walls? (Y/N 5 points) Do they appear rusty and/or with peeling paint? (Y/N 5 points)

Threshold-ranges: Negligible 0-55 points; Low 56-110 points; High 111-168; Unacceptable ≥ 169 points.
Average results: 36 score; 13.3% of Laboratories over Low threshold

3) PEOPLE/PRODUCTION FLOWS ACTIVITIES

Checking modalities: Visual inspection; interview

- Are there adequately separated areas for food processing and dedicated specific lines? (if yes, specify which) (Y/N 18 points)
- Is the layout arranged so that production is always moving forward? (Y/N 16 points)
- Are there any intersections of people and/or food between the clean and dirty areas? (Y/N 7 points)
- Does the company's production organization cause a pause in the finished products? (indicate time) (Y/N 5 points)
- Are there one or more rooms or spaces designated for the storage/pause of finished products? (Y/N 8 points)
- Are they packaged in the same room? (Y/N 8 points) Are they turned by hand? (Y/N 8 points)
- Is there continuity between the various sectors of the company? (e.g., storage areas placed away from production rooms). (Y/N 10 points) Are there doors leading outside? (Y/N 2 points) Are they washable and disinfectable? (Y/N 4 points) Do they have fly screens? (Y/N 5 points)
- Were the external access doors open at the time of inspection although no operations were ongoing? (Y/N 3 points)
- Apart from those leading outside, are there doors within the production plant? (Y/N 2 points) Are they washable and disinfectable? (Y/N 4 points) Do they have handles? (Y/N 3 points) Are any of them recessed? (Y/N 2 points)
- Are there openable windows? (Y/N 1 points) Are they washable and disinfectable? (Y/N 3 points) Do they have fly screens? (Y/N 5 points)
- Are the premises suitably clad? (Y/N 7 points)
- Are the premises suitably floored? (Y/N 7 points)
- Are the junction angles rounded? (Y/N 3 points)
- Are there one or more grates or siphoned pits for the collection of washing water? (Y/N 2 points)
- Are the premises sufficiently illuminated? (Y/N 4 points)
- Are there artificial light points? (Y/N 1 points)
- Are they recessed into the walls or ceiling or otherwise positioned to avoid dust accumulation? (Y/N 3 points)
- Are the equipment placed against the walls? (Y/N 3 points)
- Do the worktops have a raised edge with a rounded angle? (Y/N 3 points)
- Is the equipment positioned to obstruct proper cleaning of the environment? (Y/N 5 points)

Cleaning of Machines and Furniture

- Vacuum system. (0 score)
- Manual dusting with precautions (attention not to disperse flour dust, mask). (5 score)
- Dusting without special precautions, use of compressed air gun. (15 score)
- Is the equipment washable and disinfectable? (Y/N 5 points)
- Is the equipment sufficient for the company's production capacity? (Y/N 6 points)

- Are there enough sinks for washing the equipment relative to the production capacity? (Y/N 4points)
- Is there a distinct area exclusively for washing utensils? (Y/N 12 points)
- Is utensil washing done with the help of dishwashing machines? (Y/N 12 points)
- Are there one or more sinks for handwashing in the production rooms? (Y/N 4 points)
- Are the faucets manual? (Y/N 4 points) Are the sinks also supplied with hot water? (Y/N 2 points)
- Is there a non-potable water circuit? (Y/N 4 points) Is this circuit well-marked? (Y/N 4 points)
- Are vapors or fumes produced during processing? (in the cooking room) (Y/N 7 points) Is there an extraction system? (e.g., in the cooking room) (Y/N 10 points) Is the extraction system sufficient and well-positioned? (Y/N 4 points)
- Are there any dripping points from the ceiling? (Y/N 6 points)
- Is there a system for maintaining the temperature within the production rooms? (Y/N 3 points)

Use of Personal Protective Equipment (PPE)

- Masks are replaced one or more times each week. (0 points)
- Monthly. (5 points)
- Occasionally, when they break. (15 points)

Loading Mixers

- Automatic (0 points)
- Manual with specific precautions (use of mask, helmet, etc.). (5 points)
- Manual with tilting and shaking of the sack. (15 points)

Mechanical Kneading

- Fully automatic. (0 points)
- Begins after adding water. (5 points)
- Before and during the addition of water. (15 points)

Dusting of flour/flouring the surfaces

- The operation is minimized due to high production automation. (0 points)
- Specific precautions (care and attention to avoid dispersion, mask). (5 points)
- Generous throwing of flour on the table and dough. (15 points)

Double Dough

- Suitable equipment and personnel. (0 points)
- Temporal extension of personnel and equipment use with special caution procedures (mask, cleaning with vacuum during operation). (5 points)
- Acceleration of activity without special precautions. (15 points)

Threshold-ranges: Negligible 0-98 points; Low 99-197 points; High 198-295; Unacceptable ≥ 296 points.

Average results: 95.7 score; 40% of Laboratories over Low threshold.

4) PACKAGING MANAGEMENT

Checking modalities: Visual inspection; interview

- Does the company use packaging and wrapping materials? (Y/N 1 points)
- Is there a dedicated entrance for the external supply of packaging and wrapping materials? (Y/N 2 points)

- Are there one or more rooms, cabinets, or areas exclusively designated for the storage of packaging and wrapping materials? (Y/N 6 points)
- Does the supply flow of these materials from the storage area intersect with the production flow? (Y/N 3 points)
- In any case, do the storage methods of these materials indicate risks of contamination? (Y/N 7 points)
- Are some products packaged in closed containers? Describe the packaging method (Y/N 1 points)
- Is there a procedure in place to reduce the risk of physical hazards such as glass fragments, cleaning materials, metal parts, etc.? (e.g., pre-turning jars, etc.) (Y/N 4 points)

Thresholds: Negligible 0-6 points; Low 7-13 points; High 14-20; Unacceptable ≥ 21 points

Average results: 9.3 score; 73.3% of Laboratories over Low threshold.

5) HYGIENE MANAGEMENT

Checking modalities: Visual inspection; interview

- Is there excessive clutter of equipment? (Y/N 10 points)
- Is there excessive overcrowding of personnel? (Y/N 10 points)
- Are there behaviors that could affect safety? (IF SO, WHICH ONES?) (Y/N 15 points)
- Are there behaviors that could cause cross-contamination? (Y/N 20 points)
- Is there the presence of dirty clothes? (Y/N 2 points)
- Are there foods placed directly on the floor? (Y/N 12 points)
- Do the premises and equipment show a sufficient degree of cleanliness? (the evaluation of the cleanliness will take into account the ongoing work) (Y/N 7 points)
- Is there sawdust spread on the floor? (Y/N 2 points)

Floor cleaning

- Using a vacuum cleaner. (0 credits)
- Using a broom with special precautions (only at the end of production, with wetting of the floor, mask). (5 credits)
- Simple use of a broom. (15 credits)
- Are there residues and scraps from previous work on the floor and equipment? (Y/N 3 points)
- Are there foreign materials other non-pertinent material? (Y/N 7 points)
- Are there any animals present? (Y/N 15 points)
- Is there evidence of pests or their traces? (Y/N 30 points)
- Are the surfaces of walls, ceilings, and floors intact and without discontinuities? (Y/N 6 points)
- Is there evidence of infiltrations on the walls or ceilings? (Y/N 4 points)

Threshold-ranges: Negligible 0-52 points; Low 53-105 points; High 106-158; Unacceptable ≥ 159 points.

Average results: 31.4 score; 20% of Laboratories over Low threshold.

6) FINISHED PRODUCT MANAGEMENT

Checking modalities: Visual inspection; interview plus focus on management of final packaging and storage

- Does the business produce finished products that do not require refrigeration storage? (Y/N 5 points)
- Are there one or more rooms designated for storing such products? (Y/N 15 points)
- Are the various foods within these rooms separated by type to avoid cross-contamination? (Y/N 5 points)
- Are the shelves, if present, attached to the walls? (Y/N 3 points)
- Do the shelves, if present, appear rusted or with peeling paint? (Y/N 2 points)
- Is there an excessive amount of goods? (Y/N 5 points)
- Are the walls free of discontinuities? (Y/N 5 points)
- Are the floors free of discontinuities? (Y/N 5 points)
- Do they have rounded junction corners? (Y/N 3 points)
- Are the ceilings sufficiently adequate? (Y/N 5 points)
- Do they have siphoned grids for washing water collection? (Y/N 3 points)
- Focus on cooling management. Are sanitizers used? For mold containment? (Y/N 5 points)

Threshold-ranges: Negligible 0-17 points; Low 18-35 points; High 36-53; Unacceptable ≥ 54 points.

Average results: 16.3 score; 53.3% of Laboratories over Low threshold.

7) SANITIZATION AND EXTERNAL SPACES MANAGEMENT

Checking modalities: Visual inspection; interview

- Are there waste containers? (Y/N 8 points)
- Do they have pedal-operated lids? (Y/N 3 points)
- Were they open at the time of inspection? (Y/N 3 points)
- Are waste materials disposed of in a manner that does not cause cross-contamination with food or at a time after food preparation? (Y/N 3 points)
- Do they have inner bags? (Y/N 2 points)
- Is there a workstation within the production areas used as an internal office? (Y/N 4 points)
- Is the presence of sanitation products noticed in areas where food is handled? (Y/N 6 points)
- Are these products stored in incorrectly identified containers? (Y/N 12 points)
- Is there an outdoor area used? (Y/N 8 points)
- Is the area adjacent to the laboratory entrance covered? (Y/N 8 points)
- Is it paved sufficiently to avoid water stagnation, dust lifting, and allows at least superficial cleaning? (Y/N 2 points)
- Is there the presence of foreign materials? (Y/N 2 points)
- Are there one or more waste containers for waste produced in the laboratory? (Y/N 2 points)
- Are there one or more containers for collecting used packaging? (Y/N 2 points)
- Is there waste outside the containers and designated waste storage areas? (Y/N 2 points)

- Are there signs or traces of the presence of pests? (Y/N 4 points)
- Are there any specific conditions not mentioned above that may increase or decrease the risk score? If yes, report them here, adding or subtracting a score within the range of +30 to -30,

Threshold-ranges: Negligible 0-15 points; Low 16-31 points; High 32-48; Unacceptable ≥ 49 points.

Average results: 7.3 score; 13.3% of Laboratories over Low threshold.

8) CHANGING ROOM

Checking modalities: Visual inspection; interview

- Is there an area, room, or part of an office where operators can change clothes away from the production area? (Y/N 25 points)
- Does the changing room coincide with the anteroom to the bathroom? (Y/N 4 points)
- Is the changing room sufficient for the number of employees? (Y/N 2 points)
- Is it equipped with lockers? (Y/N 10 points)
- Do the lockers have separate compartments for clothes and shoes? (Y/N 3 points)
- Do the lockers have sloping tops or are they recessed into the walls? (Y/N 2 points)
- Are they in good condition and sufficiently clean? (Y/N 3 points)
- Are they made of washable and disinfected material? (Y/N 2 points)
- When opened, is the division between clean and dirty clothes respected? (Y/N 3 points)

Work clothes

- Placed in the changing room, separated from civilian clothes. (0 points)
- The separation of clothes is partially adequate. (5 points)
- Changing of clothes occurs at home. (15 points)

Threshold-ranges: Negligible 0-17 points; Low 18-35 points; High 36-53; Unacceptable ≥ 54 points.

Average results: 7 score; 13.3% of Laboratories over Low threshold.

9) PERSONNEL HYGIENE AND BEHAVIOR

Checking modalities: Visual inspection; interview

- Is the personnel appropriately dressed? (Y/N 10 points)
- Are they wearing suitable headgear? (Y/N 3 points)
- Are they wearing work shoes? (Y/N 2 points)
- Are they waterproof? (Y/N 2 points)
- Are they light-colored? (Y/N 2 points)
- Are the overgarments sufficiently clean relative to the production cycle? (Y/N 3 points)
- Are the nails, hands, and arms of the staff clean? (Y/N 4 points)

- Is the personnel wearing rings, jewelry, watches, or nail polish? (Y/N 3 points)
- Are there any staff members with uncovered wounds on their hands or arms? (Y/N 10 points)
- Do the workers have appropriate training certificates for their tasks? (Y/N 8 points)
- Is there any staff smoking, or are cigarette butts noticeable? (Y/N 3 points)
- Is there any personnel eating during work? (Y/N 2 points)
- Are there any specific conditions not mentioned above that may increase or decrease the risk score? If yes, report them here, adding or subtracting a score within the range of +10 to -10.

Threshold-ranges: Negligible 0-14 points; Low 15-29 points; High 30-45; Unacceptable ≥ 46 points.

Average results: 6.9 score; 13.3% of Laboratories over Low threshold.

10) TOILETS

Checking modalities: Visual inspection; interview

- Are the restroom facilities easily accessible to the staff? (Y/N 5 points)
- Is the number of restroom facilities sufficient for the company's personnel? (Y/N 5 points)
- Is there a separation area between the restrooms and the production area (ante-bathroom)? (Y/N 15 points)
- Are there sinks in the restrooms? (Y/N 25 points)
- Are the sinks located in the ante-bathroom? (Y/N 4 points)
- Are the faucets manual? (Y/N 5 points)
- Do the toilet bowls have a flush system? (Y/N 10 points)
- Is toilet paper available in the restroom? (Y/N 5 points)
- Are the towels disposable (including air dryers)? (Y/N 3 points)
- Are the doors washable and disinfectable? (Y/N 3 points)
- Is the door between the ante-bathroom and production areas free of handles? (Y/N 3 points)
- Are there sliding doors? (Y/N 2 points)
- Is the restroom equipped with an air extractor or a window or another system that ensures air exchange? (Y/N 7 points)
- Is the air exchange ensured by an air extractor? (Y/N 1 points)
- Does the air extractor run automatically for a sufficient period after the staff leaves the restroom? (Y/N 2 points)
- Is the air exchange ensured by a window? (Y/N 1 points)
- Is it equipped with a fly screen? (Y/N 4 points)
- Are the restroom floors suitably paved? (Y/N 5 points)
- Are the restroom walls suitably covered? (Y/N 5 points)
- Are the corner joints rounded? (Y/N 3 points)
- Do the restrooms have grates with traps for washing water drainage? (Y/N 3 points)
- Are the restrooms sufficiently clean? (Y/N 8 points)
- Are there any specific conditions not mentioned above that may increase or decrease the risk score? If yes, report them here, adding or subtracting a score within the range of +5 to -5.

Threshold-ranges: Negligible 0-34 points; Low 35-69 points; High 70-105; Unacceptable ≥ 106 points.
Average results: 7.6 score; 0% of Laboratories over Low threshold.

11) SPECIAL CASES

Checking modalities: Visual inspection; interview

- Is the company equipped with a wood-fired oven station for the preparation and baking of baked goods (cookies, pizzas, or similar products)? (Y/N 13 points)
- Is the wood storage area clearly separated from the area where food is present? (Y/N 6 points)
- Is the wood stored on pallets that keep it off the ground? (Y/N 2 points)
- Is the type of wood among those approved for use? (Y/N 18 points)