A Simple Pizza Algorithm for Economists

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I.   Introduction

One of the key questions in Economics is what to eat for dinner. Pizza is generally considered to be good for dinner.[1] It may also be good for thriving in Economics, which is the subject of this volume, but there the evidence is less conclusive.

Singh and Goyal (2011) in their discussion of the beneficial effects of pizza emphasize how: *"Pizza is one of the most popular family foods worldwide and has gained widespread consumer acceptance as a healthy and convenience food".*[2] A well-balanced Pizza Margherita (only barbarians use the term Margherita Pizza or the even more terrifying Cheese Pizza) is commonly believed to contain *"30 percent daily amounts of energy and all nutrients"* (Combet et al., 2014). A full review of the literature on pizza is beyond the scope of this chapter, as mostly we wish to eat, but the interested reader may refer to Helstosky (2008) for a comprehensive discussion.

Notwithstanding the benefits of pizza, the puzzle of why rational agents may patronize the likes of Domino's Pizza, Inc., Papa John's International, Inc. and Little Caesar Enterprises Inc. or even put pineapple on pizza remains largely unsolved. Rational agents misperceiving social norms, bounded rationality or simply people not having a clue are likely explanations.

The goal of this chapter is to show how economic agents, who may be behavioral, can make pizza from scratch. We provide a two-step algorithm to make pizza.

Each step is about 15-20 minutes in duration and possible with standard cooking and computing tools available to most economists.

In several simulations, our pizzas turn out to be good. However, sometimes our pizzas turn to be not so good because stuff happens.

II.   Tools and Ingredients for Pizza Dough Phase

The implementation of this first phase requires a large bowl, two cookie sheets, a roll of parchment paper, and a spoon. The ingredients required for the dough are five. As typical of Italian cooking, one needs very few ingredients, but they need to be of high quality:

(i)   Italian white flour "00", 1kg pack;[3]
(ii)   Warm water, 2 cups (0.5 liter);

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[1] Trebbi (2021).

[2] The fact that the authors write on the oxymoronic British Food Journal should not distract the reader from the fact that ample empirical evidence on the validity of this statement is available, especially in areas where people know what they are talking about when it comes to food, like Italy.

[3] Antimo Caputo brand is suggested. See Figure 1.

(iii)   Salt, 5 teaspoons (~30g);

(iv)   Extra virgin Italian olive oil, 2/3 cup (0.15 liter).[4]

(v)   Active dry yeast, 3 Pk, 0.75Oz (~22g) packets.[5]

Figure 1: Suggested Ingredients

III.   Pizza Dough Phase

The agent should begin this phase by washing their hands. Then, pour the warm water into a large bowl and add the dry yeast.

It should not be necessary to show this step, but as stated above some may be behavioral agents, so please check out Figure 2.

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[4] The olive oil has to be extra virgin (anything less indicates the use of other oils other than olive oil). It should look greenish (green, as opposed to yellow color, is indicative of freshness, and, contrary to wine, olive oil degrades with time and it is never better than at the time of first pressing);

[5] We could use fresh yeast, but as it come in large packets the behavioral agent would throw away 80 percent of it the next day unless one would wish to cook and eat pizza for two weeks straight. We could use sourdough or other wild yeasts cultivated over centuries, but this algorithm is designed for agents who try to survive in the Economics profession, and not hopeless hipsters.

Figure 2: Yeast Mixing

One should stir the water-yeast mix until we see what looks like swamp water, as in Figure 2. This "activates" the yeast. (Trust me, you want that sucker to be very active.)

The next step is to add the flour, the salt, and the olive oil as shown in Figure 3.

Figure 3: Adding stuff in. It's not rocket science.

The next step of this phase requires putting the agent's hands inside the bowl and start mixing the ingredients up. It is recommended to squeeze the hell out of it and kneel the mass until the mixture start taking a more structured and firm form.

Figure 4: Dough. Big Deal

At this point one should put the dough to sleep for at least five hours (or more).

Importantly, the bowl should be covered with a slightly damp clean kitchen cloth (please not the kitchen towel that has been around since you moved in last year). One can replace the damp cloth with cling wrap – the lack of air circulation will not be a problem and in fact is an advantage to the rising of the dough keeping it moist. See Figure 5.

Figure 5: Covering the Dough. Not sure why we are putting this picture in, it's so obvious.

At this point the agent should go check on that code that is running on the computer or try to finish that proof.

For senior faculty, the pizza dough phase should occur in the morning, before going to the office, with the goal of running phase two of the algorithm for dinner. For a PhD student or early career researcher the suggested time of implementation varies with the lunar phase and sleep needs.

IV. Pizza Making Phase

This section illustrates the second phase of the procedure. After 5 hours the dough from Figure 4 should assume an inflated, "risen" look, similarly to what illustrated in Figure 6. The agent should again wash hands before starting.

Figure 6: Risen Dough. It should feel puffy to the touch.

For implementation, the technical requirements vary. Here we assume a workhorse electric oven such as the General Electric 30 in. 5.3 cu. ft. Electric Range in white, beloved by graduate student dorm designers around the United States. We recommend to crank the hell out of this thing and put it on max heat (typically 550F). If the oven is not crappy, we suggest to crank it up anyway. Fancy stuff like pizza stones or Ooni or anything that you buy at Williams Sonoma or Sur la Table is not needed.

While the oven is warming up, which may take a while depending on how long ago your dorm kitchen was built, one should divide the dough in five or four balls of roughly equal size (300g each, approximately) – see Figure 7. Some leftover flour could be sprinkled over the dough, to make it easier to handle and flatten.

Figure 7. Balls

At this point, if a rolling pin is available, one should try to flatten the dough with the instrument, else one should apply physical strength with hands. The advantage of the manual solution is that the body heath of the hands induces a relaxation of the dough and facilitates its handling. Plus it feels more professional.

The dough has to be flatten until it is very thin. Very thin.

At this point one lays out the dough on the parchment paper and onto each of the two cookie sheets, as shown in Figure 8.

Figure 8. Flattened dough.

Symmetrically to the dough making phase in Section II, there are only five ingredients for the pizza making phase.

(i)   Finely Chopped Tomatoes, 2 cans;[6]
(ii)   Oregano;
(iii)   Salt;
(iv)   Extra virgin Italian olive oil;
(v)   Mozzarella.

Basil or capers at this point are fantastic, but life is complicated. Also one may add to the list their favorite toppings at this point. We suggest not to add more than one or two toppings. The key in this phase is to keep it simple.

With the spoon spread the tomatoes unevenly, but without leaving massive uncovered areas. See Figure 9.

Figure 9: Tomato sauce

For a discussion of pizza quality evaluation using computer vision with application to base and sauce spread analysis see Sun and Brosnan (2003a). You would think we must be joking, but no, it is a real reference.

Sprinkle the salt (four or five hits with a salt shaker – not much).

Now we should apply "un filo d'olio" - just two thin lines of olive oil, like when drawing a supply and demand curve (see un filo d'olio in Figure 10).

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[6] Mutti brand is suggested. See Figure 1.

Figure 10: Tomato sauce with "un filo d'olio"

We now add the oregano following the same instruction as for salt.

This is also when the mozzarella, in six-seven fairly large and thick slices should be added. Mozzarella choice would require a chapter in itself. It is a well-established empirical regularity that it is impossible to find decent mozzarella on a budget outside of Italy.

However, after extensive experimentation, we suggest that even relatively cheap Galbani mozzarella or the shredded ones at the supermarket are dry enough to work well with pizza. See Figure 11.

Figure 11: Adding mozzarella

We suggest not to use anything too wet, like mozzarella di Bufala. The excessive water content of Bufala would result in a soggy pizza. Contrary to common misperception, classic Neapolitan pizza uses a type of mozzarella called Fiordilatte, which is quite different from Bufala - more compact and less creamy.

At this stage we add toppings. Again we suggest one topping – don't mess this up now putting figs or chicken sausage or bananas. Crucially, absolutely no pineapple. This wonderful fruit should never ever be used on pizza, else we are sending someone to your house.

For a discussion of pizza quality evaluation using computer vision with application to pizza toppings analysis see Sun and Brosnan (2003b). You would think now this cannot be possibly a true research article, but no, again, these people did actually write this stuff. And there is even worse. For example Verdi et al. (2020) consider the use of dehydrated mix of tilapia and salmon. The authors should be all arrested on sight.

As soon as your oven reaches the temperature of 550F, we need to put the sheets in the oven. Chances are the agent has two levels of racks in the oven and should be both used. One pizza should go on the upper rack, the other below.

The baking time is approximately 18 minutes. After 9 minutes, we swap the upper and lower sheets, to allow an even cooking of both pizzas. Importantly the agent must look at the pizza and the mozzarella must be turning minimally golden by the end of the baking phase.

The pizza is then done, as in Figure 12.

Figure 12: Pizza

V.   Extensions: Schiacciata

An easy extension of this application is called schiacciata. This is faster and an equally effective food choice. It only requires coarse salt, rosemary and olive oil on top of the dough. It is easier to make and it goes well with prosciutto and cured meats.

Once again, one sheet goes up the other down in the oven, with the only difference that we keep baking time to 14 minutes total. After 7 minutes, one must swap the upper and lower sheets.

See Figure 13 for the demonstration of this extension.

Figure 13: Schiacciata

VI.   Conclusions

This chapter proves that economists can make pizza from scratch by meeting a limited set of technological requirements.

Given that pizza is good, we conclude that thriving in Economics could involve pizza making and benefit from it. Future research should investigate the role of Tiramisù.[7]

References

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[7] We notice here the accent on the last vowel, like the good people at NYT do (see https://cooking.nytimes.com/recipes/1018684-classic-tiramisu). The spelling Tiramisu to an Italian sounds like the name of a Japanese entrée.