

# Eggonomics: Vitrification and bioeconomies of egg donation in the United States and Spain

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## Abstract

Regulations governing assisted reproduction control the degree to which gamete donation is legal and how people providing genetic material are selected and compensated. The United States and Spain are both global leaders in fertility treatment with donor oocytes. Yet both countries take different approaches to how egg donation is regulated. The US model reveals a hierarchically organized form of gendered eugenics. In Spain, the eugenic aspects of donor selection are more subtle. Drawing upon fieldwork in the United States and Spain, this article examines (1) how compensated egg donation operates under two regulatory settings, (2) the implications for egg donors as providers of bioproducts, and (3) how advances in oocyte vitrification enhances the commodity quality of human eggs. By comparing these two reproductive bioeconomies we gain insight into how different cultural, medical, and ethical frameworks intersect with egg donor embodied experiences.

## KEYWORDS

egg donation, commodification of the body, bioeconomies, cryopreservation, United States, Spain

The use of donor eggs in fertility treatment has increased substantially over the past 40 years. This expanding global market is linked in part to delayed childbearing (Gietel-Basten et al., 2017; Konvalinka, 2014; Konvalinka and Corrochano, 2012), increased restrictions on international adoption (Scherman et al., 2016), and the rising numbers of individuals and same-sex male couples accessing fertility treatment (Marre et al., 2017). To meet the demand, donor recruitment is often facilitated by offering financial incentives to young, fertile women in exchange for their “time and trouble” to undergo

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the egg donation process (Ahuja et al., 1999), but the degree to which donors can be compensated varies across borders. Egg donation is a physically and emotionally demanding process, involving several weeks of hormone injections to create higher quantities of eggs, followed by surgery, usually under anesthesia, to remove each of the oocytes from the ovarian follicles. Medical risks—about which donors are minimally informed—can be substantial and increase according to the medication protocol used and the number of oocytes the donor produces (Tober, et al., 2021; Tober, Richter, et al., 2020).

Regulations surrounding the procurement and use of donor eggs vary from country to country, thereby driving donor egg fertility treatment from more restrictive to less restrictive countries. The United States and Europe—where Spain performs over half of donor egg in vitro fertilization (IVF) cycles—both emerge as the two largest egg donation bioeconomies in the world (Calhaz-Jorge et al., 2017; Tober and Pavone, 2018). By comparing how oocyte donation operates in the United States and Spain, this article illuminates how different regulatory frameworks impact how medical biomarkets function, how regulations intersect with clinical practice, and the implications of different systems for the egg donors who supply the material that sustains an industry. By examining the rise of oocyte vitrification in both locations, we further gain insight into how technological developments facilitate changes in medical practice and oocyte distribution, which also have implications for egg donor selection and care. This article contributes to social science literature on bioeconomies and the commodification of the body (Almeling, 2007, 2011; Cohen, 2001; Lafuente-Funes, 2017, 2021; Pavone and Goven, 2017; Scheper-Hughes, 2007; Scheper-Hughes and Lock, 1987; Tober and Pavone, 2018; Waldby, 2015, 2019), the global geographies of assisted reproduction (Schurr, 2018; Inhorn, 2020), and cross-cultural analyses of infertility and gamete donation (Deomampo, 2019; Inhorn, 2020; Nahman, 2011, 2018; Whittaker et al., 2019).

In their discussion of “gendered eugenics” in the US egg and sperm industries, Cynthia Daniels and Erin Heidt-Forsythe illuminate the problematic aspects of the US free market in human gametes as both reflecting social beliefs surrounding human value and exacerbating hierarchies based on race, gender conformity, and class (2012). Others have also indicated how donor selection is a means of “curating race” (Moll, 2019), how human eggs are “racialized commodities” (Deomampo, 2019), and how donor-recipient matching amplifies “white desirability” in the transnational fertility industry (Pande, 2020, 2021), all of which exemplify what Tober and Kroløkke refer to as a form “reproductive colonialism” (Tober and Kroløkke, 2021). This article builds upon this work to examine how egg donor selection is organized in two different reproductive bioeconomies. Since the United States and Spain take very different approaches to donor selection and compensation, we can compare the implications of both highly commodified and less commodified models. In the United States, egg donors are selected, compensated, and organized according to a hierarchical model. In Spain, while similar eugenic forces are still in play, due to restrictions on how donors are selected and compensated, we see a more lateral approach. High-demand US egg donors also participate in negotiation and self-commodification in ways that are not found among their Spanish counterparts.

In their discussion of the impact of vitrification on fertility treatment, Baldwin et al. examine how vitrification is “transforming the reproductive landscape in novel and complex ways” (Baldwin et al., 2019, 713). With a comparison of egg donation in the UK, Belgium, and Spain, Sara Lafuente-Funes et al. further address how oocyte vitrification gives rise to new commercial opportunities in the European context (Lafuente-Funes et al., 2023). The authors explain how Spain, unlike the other two European egg donation settings, exhibits a “closed-door market-driven system” in which donors receive little information about how their eggs are distributed and express concern about profits being made from their donations (Lafuente-Funes et al., 2023). The US egg donation system is more blatantly market-driven than the one in Spain, but unlike the “closed-door” approach, the commercialization of oocytes in the United States is normalized—although metaphors of the “altruistic gift” still permeate the industry—and donor access to their medical information or oocyte distribution varies between clinics.

While other scholars have compared egg donation in other European contexts, to our knowledge this article presents the first study to compare the radically different approaches found in the United

States and Spain—the world's two most robust donor egg markets. A US/Spain comparison of how these biomedical markets operate offers new insight into different systems of body commodification and how donors see themselves as actors in the egg industry. The mobilization of frozen and banked oocytes further heightens the commercial elements in both locations. But in the United States, different mechanisms for donor compensation and oocyte distribution magnify an unparalleled system of gendered eugenics, where donor ancestry, education, and gender conformity are hierarchically organized and reflected in how donors are selected and paid (Daniels and Forsythe, 2012). As Diane Tober notes, in the sperm banking industry donors are similarly selected based on traits that may make them more appealing to recipients—what she refers to as “grass roots eugenics”—but unlike egg donors, they are not compensated differently based upon possessing “high-demand” traits (Tober, 2001, 2018). Similarly, in a more egalitarian egg donor compensation structure, like the one that exists in Spain, while eugenic overtones do influence who is selected to become a donor, they do not impact donor fees or patient costs. In the US system, also unlike Spain, frozen and banked oocytes are often viewed as being a more “affordable option” for intended parents than eggs provided for fresh cycles for a single recipient. For egg donors, this often translates to feeling like they have “low budget” eggs.

Catherine Waldby illuminates how vitrification has led to new meanings of oocytes as biomedical objects and new models for distributing oocytes across borders (Waldby, 2019). In both the United States and Spain, oocyte vitrification has expanded the market for both donated oocytes and “elective egg freezing” for fertility preservation (Inhorn, 2017; van de Wiel, 2020; Waldby, 2019). Compared to fresh egg donation cycles, in these new distribution models frozen oocytes obtained from a single donor can be more easily distributed among multiple recipients, thereby expanding their reach through space and time (Álvarez Plaza and Galán, 2017; Tober, 2018). According to Lucy van de Wiel (2020), the ability to freeze and preserve oocytes not only transforms the temporal reality of human reproduction for people who freeze their own eggs but also expands the financialization and profitability of oocyte procurement and distribution. Within the context of egg donation, vitrification technology has transformed how donor eggs are procured, owned, and distributed through the clinic or egg bank, both locally and globally, with a concomitant rise in clinic profits.

Drawing upon ethnographic fieldwork in the United States and Spain, we focus on three core issues related to the bioeconomies of human eggs. First, we compare the respective regulatory foundations underlying the US and Spanish systems, including donor selection and compensation. Second, we explore how these different approaches to regulation affect the practice of oocyte donation in clinics and egg banks and frame the space in which egg donors are selected and undergo the donation process. Finally, we discuss how recent advances in egg freezing technologies create yet new supply and demand pressures in both regulated and (under-) regulated human egg markets and differentially amplify the dynamics of commodification and selection.

## METHODS

The data presented in this article emerge from independent investigations conducted by the authors. By bringing together our respective sets of data we explore overlapping themes, and how these themes fit together in different ethnographic contexts. The findings presented here are based on the efforts of two research teams:

The OVADO Project, conducted between 2018 and 2023, examines the effects of socio-cultural context on human biomarkets in the United States and Spain and egg donors' decisions and experiences under these two different regulatory systems. Research methodologies for this project include online egg donor surveys in Spanish ( $n = 171$ ) and English ( $n = 560$ ), each designed for the specific context, egg donor interviews (70 in Spain and 210 in the United States), interviews with professionals (30 in Spain and 52 in the United States), and observations in Spanish and US clinics and practices. This team includes both Spanish and US research anthropologists.

TABLE 1 Comparison of US and Spain Egg Donation Models

	United States	Spain
<b>Similarities</b>	Donor compensation for time, expenses, discomfort permitted Lower-income women recruited more frequently Primary destination for fertility travel	
<b>Differences</b>	Intended parents choose donor from online profiles, seeking specific traits	Clinic professionals choose donor for intended parent/patient based on phenotypic resemblance to intended mother
	Known, open identity, and anonymous donation negotiable, meaning donor may one day meet intended parents and/or genetic children	Anonymity is mandatory
	Unlimited donor compensation with wide range, USD 0–250,000 with an average of approx. USD 7,000* Reference: Minimum yearly salary: USD 15,080**	Fixed donor compensation with limited variation EUR 800–1200 (USD 900–1400)* Reference: Minimum yearly salary: EUR 19,006**

Source: \*Information from fieldwork and survey data, 2018–2022; \*\*Information for 2020, from OECD <https://stats.oecd.org/index.aspx?DataSetCode=RMW>.

The BIOARREME National Research Project team conducted semi-structured interviews with 20 biomedical professionals working in egg donation programs in nine private clinics of different sizes throughout Spain and one public hospital. Interviews were conducted with a range of professionals, including gynecologists, embryologists, marketing directors, and program directors.

For both projects, face-to-face, semi-structured interviews lasted between 45 and 90 minutes; interviews were transcribed, coded, and analyzed through thematic analysis (Marshall and Rossman, 2011). This method facilitates the systematic development of analytic categories, which are sensitive to the specificities of the national context and ensure research questions are addressed (Silverman, 2015). Pseudonyms are used for interview participants throughout the article.

## GAMETE MARKETS AND REGULATIONS IN THE UNITED STATES AND SPAIN

According to the US Society for Assisted Reproductive Technology (SARTCORS) data, between 2016 and 2017, roughly 49,193 donor oocyte retrievals were performed in the United States, which included 17,099 unique donors with an average of 2.4 cycles per donor (cited in Kawwass et al., 2021). Equity researchers estimate that the US fertility industry market was valued at roughly USD 3–4 billion in revenue in 2015, and the 2018 US donor egg IVF market size was valued at USD 487 million (Grand View Research, 2019). According to the Spanish Fertility Society, about thirty percent of all IVF treatments involve the use of donor eggs (SEF, 2017), and Spain alone performs more than half of the egg donation cycles in Europe (Pennings et al., 2014). As of 2017, out of a total of 127,809 IVF cycles performed, 37,995 involved transfers of embryos created from fresh or vitrified donor egg cells. In 9 percent of cases (12,070), the patients were non-Spanish women coming mostly from other European countries (SEF, 2017).

In the United States, legislation varies widely from state to state, with some states more restrictive than others (Heidt-Forsythe, 2018). In Spanish law (Ley 14/2006), there are three main restrictions on egg donation: 1) gamete donors must remain anonymous; 2) donations must be “altruistic,” meaning only modest compensation; and 3) clinic professionals select donors on behalf of patients according to medical and phenotypical similitude between donor and recipient. Table 1 summarizes the egg donation landscape in the two countries:

As Table 1 indicates, the three main ways egg donation in the United States and Spain differ include: donor selection, donor compensation, and approaches to anonymity. Here, we focus on the first two. In the United States, the American Society for Reproductive Medicine (ASRM) suggested limiting donor compensation to USD 10,000, but this guideline was removed in 2015 after a lawsuit against the ASRM for “price fixing” was settled in court (ASRM, 2007; Klitzman and Sauer, 2015). The removal of the ASRM guideline affected how industry professionals recruit prospective egg donors and enabled fluctuating compensation based on both physical and social traits as well as the egg donor’s ability to negotiate.

In Spain, the maximum amount of compensation is around EUR 1200 with some regional variation; it only increases according to the annual inflation rate and is slightly above 2022 Spanish minimum wage of EUR 1000/month.<sup>1</sup> Donors cannot be paid more based on physical or social traits, nor do they have any power to negotiate the terms of their contracts. Many egg donors in Spain are unemployed or employed in precarious labor and are at least partially motivated by the compensation (Jociles et al., 2021; López-Gálvez and Moreno-García, 2015; Molas Closas, 2021). In the United States, the high costs of education and student loan debt drive the egg market in ways that are not found in Spain, where the cost of education are minimal. While US egg donors often have more flexibility to negotiate compensation and contract terms—especially if considered “high demand donors”—this flexibility also creates a tiered market in human eggs that is not found in Spain or elsewhere in the world. What constitutes “high-demand” is driven by market forces in which consumers (intended parents) value some traits over others.

## The US model: Self-commodification in a tiered free market

The US system is rooted in a “free market,” “consumer choice” model, reflecting underlying US cultural values embedded in late capitalism and supply-demand economics. These values infiltrate US medical systems, particularly when it comes to the commodification of human eggs. In the United States, there are different options for finding an egg donor and for negotiating contact between recipients and donors. Some fertility clinics have their own internal programs, where donor recruiters and coordinators manage the program and interface with egg donors throughout the process. Other clinics work with egg donation agencies. Agencies are unregulated businesses that recruit women to provide eggs and, in some cases, act as go-betweens for donors and recipients. As Janette Denevan Catron (2014) illustrates, in the absence of regulation, egg donation agency professionals often draw upon their own personal moral belief systems to frame and curate the donation process. Preferences regarding donor traits, contact/anonymity, and oocyte ownership and distribution are all negotiable within contracts and at different price points.

At most US agencies and clinics, a database is available where donors create online profiles for intended parents to peruse, often likened to a dating profile. With guidance from agency recruiters and coordinators, donors construct their profiles to appeal to intended parents so they will be selected. Online donor profiles usually include childhood and current photos with both head and full-body shots; information about favorite foods and hobbies; and other information like height, weight, eye color, and ancestry. Some agencies hire professional photographers and makeup artists to do photo and/or video shoots with their donors, to present them in the best possible light. Online donor profiles may be further curated by the donor coordinator or agency marketing professional to enhance their appeal. This system is specifically and visually gendered in ways that, again, are not reflected in the buying and selling of human sperm. Rarely, if ever, do sperm donors include adult photos in their online profiles, let alone modeling shots, nor does sperm donor compensation routinely fluctuate based on traits (Álvarez-Plaza, 2008; Tober 2001, 2018).

Some US agencies specialize in “hard-to-find” donors—including women of specific backgrounds, such as Asian or Jewish ancestry, or who are deemed highly attractive, possess specific traits, attend Ivy

League schools, have advanced degrees, and/or possess athletic or musical talents. For example, Lisa C., founder of a Southern California egg donation agency that specializes in “elite” Asian donors, describes what her clients are looking for:

One thing I see across the board is that people want individuals who are pretty. If they tell you they want someone attractive what they mean is they want someone who is *extremely* attractive... . You know we work for individuals that are looking for the hard-to-find donors, and whether it’s that ethnic mix, or a combination of difficult traits that you’re combining together, that group is really looking for education and aesthetic beauty... . Typically, our donors are compensated between five and ten thousand dollars. But in our elite program, it starts at ten thousand dollars and goes up from there... . We once had an intended parent from China who wanted to pay their donor a quarter million dollars.

While compensation into the hundreds of thousands of dollars is rare, US donors who know they meet “high-demand” standards will shop around for agencies they know will pay more or will negotiate their fees, akin to what Charlotte Kroløkke refers to as taking an entrepreneurial approach to the donation process (Kroløkke, 2015). Renee D., for example, is a blond, 25-year-old three-time donor who is pursuing a medical degree. She became interested in egg donation after a conversation with her uncle and his husband, who were trying to start a family through surrogacy. But she knew she would only provide eggs under certain conditions:

I looked around at a lot of agencies. I only received sixty-five hundred [dollars] for my first cycle—which was nice, but it didn’t feel like much compared to everything I had to go through. There were about six couples interested as soon as my profile went live, and they were all competing and trying to outbid each other. So, I started thinking that I would really rather get between eight and ten thousand per cycle. And my boyfriend said, “Why not eighteen to twenty?” ... I was kind of ambivalent about doing it again. I had to weigh, at what point is it not worth it to me? So, I told them I would do it for 20K and I got picked right away.

Once Renee had the experience from her first cycle and learned how her value was positioned within the donor egg market, she was able to set terms and compensation that she felt reflected her procreative value. Her ambivalence about donating again further contributed to her ability to negotiate.

In the US model, some egg donors have the power to negotiate their terms in ways that donors in Spain cannot. These negotiations usually focus on compensation, the degree of openness between the donor and intended parents, and future release of donor identity to children born from their eggs. Popular donors may also have waitlists of intended parents who attempt to reserve them in advance, leading many to undergo back-to-back cycles with little time for their bodies to recuperate. Donors in Spain are less exposed to supply-demand fluctuations and the associated emotional pressure and increased physical demand that accompany being a “high demand” donor, but they also lack the power to negotiate. The US “patient choice” model amplifies a system in which some individuals are perceived to be worth more than others and are paid accordingly. As Felicity, a three-time donor from Los Angeles puts it, “We’re products. We’re no different than Apple vs. Dell.” Ironically, while high-demand donors can make substantially more money, the increased pressure to donate can also lead them to bear the medical burden of increased risk, feel pressured to undergo back-to-back cycles, and undergo the donation process far beyond the six-limit guideline set by the ASRM (Tober et al., 2021). Donors in Spain do not appear to experience the same degree of pressure to produce and, unlike in the United States, the existence of a donor registry in Spain prohibits donors from going beyond the legal cycle limits.

Adding to the commercial aspect, in the US bioeconomy system donor compensation is also taxable income (“*Perez v. Commissioner of Internal Revenue*, 144 T. C. No. 4,” 2015). Internal Revenue Service (IRS) taxation places an enormous burden on already-struggling egg donors, as Jenna V. explains:

This agency issued a 1099 on me, but I didn’t know it. It’s been a disaster! I was like 22, and a desperate college student, working but barely making ten dollars an hour. And the IRS audited me and took everything I had. And I was this broke college student—which is why I donated my eggs in the first place—but I had to make these tax payments for almost three years.

While US egg donors can actively participate in negotiating higher compensation, the financial consequences that accompany taxation laws reduce or eliminate the benefits of higher pay. These consequences are not experienced by donors in Spain, who are not taxed on their compensation and are paid with cash in an envelope immediately after oocyte retrieval.

### The Spanish model: Regulating compensation and selection

The Spanish system requires donor anonymity, limits the amount of compensation a donor can receive to between EUR 800–1300, and offers donors and recipients very little, if any, information about each other. According to the data available in 2017, of the 494 licensed fertility centers existed across Spain, 314 of these were private clinics and 153 were public hospitals (CNHRA, 2018). Public hospitals may provide some fertility treatment with donor eggs for Spanish citizens, but only under very limited conditions, and they do not recruit egg donors, nor do they have internal egg banks. In Spain, most donor egg IVF occurs within private fertility clinics, where business thrives—especially with the influx of patients from abroad (Pavone and Arias, 2012). Spanish law—unlike US law—prohibits clinics and egg banks from advertising to target specific ancestral groups, from advertising on college campuses, or from even mentioning compensation in donor advertisements. In the absence of direct marketing, donor recruitment often occurs by leveraging the social networks of current donors and offering them financial incentives to bring in their friends.

In Spain, many private fertility clinics have internal egg donation programs and frozen egg banks, some of which were established well before recent advances in oocyte vitrification. Spanish clinics have long held to a model in which a donor is donating to the clinic, not the intended parents, unlike in the United States. The clinic owns whatever oocytes a donor produces and distributes batches of oocytes between different sets of intended parents over different points in time. For example, if a donor produces 20 oocytes, the clinic may fertilize two or three to create embryos for a fresh cycle for a current patient, then freeze the remainder in batches for future patients. While there are no direct-to-consumer egg donation agencies as in the United States, egg donation coordinating businesses have recently made their way into the Spanish egg market. Several of these businesses act as intermediaries, by recruiting and organizing prospective donors into their databases to serve small and medium-size fertility clinics that do not have their own donor egg programs. Clinics can directly purchase a lot (or batch) of oocytes. For the smaller clinics, it is often less expensive and time consuming to outsource donor selection through coordinating agencies to reduce administrative and logistical burdens.

Since Spanish law requires donor-recipient anonymity and phenotypic similitude, fertility professionals select donors on behalf of their patients using a variety of techniques. Donor-recipient phenotypic matching is facilitated by genetic testing, blood sampling, and biometric facial matching with the assistance of artificial intelligence (AI) 3D facial recognition platforms. Several companies have emerged in Spain that specialize in facial biometric analysis software that fertility clinics now use. This selection process is based on resemblance—rather than social factors such as education, hobbies, and interests—and is therefore considered by medical professionals to be more objective and “based on

science.” Nonetheless, matching donor and recipient also depends on the eye of the professional who is doing the selecting (Lafuente-Funes, 2017). According to Mario V., an egg bank coordinator,

When you explain it to them [the intended parents], we tell them that we have to look for someone [a donor] who is phenotypically compatible with them... . Because obviously they are going to have a child and will have to have the same eye color, hair color, blood group, race, height, and complexion.

Fair-skinned donors, university students, or people with specific talents are also highly desired in Spain, but they cannot be compensated more based upon these traits, and they remain invisible to prospective recipients. Unlike in the United States, donors in Spain do not fill out extensive profiles with photographs and other information for intended parents to peruse. Intended parents receive very little information about their donor other than to be assured they are medically screened, are healthy, and resemble the intended parents. This is how Dr. Maria N., a gynecologist from a large clinic in Madrid, explained it:

When they [patients] come here for ova donation, we tell them clearly. “We match on physical characteristics. If you are Caucasian, the donor has to be Caucasian. If you have pale skin, the donor will have pale skin; it’s the same for brown.” It’s our intention that the donor has to look like the recipient. It’s not 100 percent, but the closest we can [match]. Some come and initially ask you to find someone with a narrow nose. Okay? If we have one, and they both have a narrow nose, then why not? But if they don’t have a narrow nose, we’ll tell them, “You don’t have such a narrow nose.” These are the guarantees we offer, nothing else.

Selection also favors the acceptance of donors who appear to comply with normative looks and behaviors (Lafuente-Funes, 2017; Molas Closas, 2021; Molas Closas and Perler, 2020). Egg donor recruiters select socially “desirable” profiles and screen out donors who professionals perceive as having bad social or sexual habits, such as drinking, smoking, promiscuity, or those who dress and behave in non-normative ways. Dr. Ana G., a physician at a medium-sized fertility clinic, explained this screening process:

So, imagine that they are women who declare that they have had psychiatric treatment, or may have had thoughts of suicide, or have an absolutely unstable life with multiple partners every two months. If you see that there in the interview in their environment, something that catches your attention, then we will not accept them in the program.

Since regulations in Spain limit donor compensation, and physicians choose donors on behalf of their patients, Spain avoids the financially tiered market in human eggs that exists in the United States. However, donor selection biases are still at work in more subtle ways. Some authors have defined these selection biases as a “quasi-social market,” in which donor selection reinforces gendered stereotypes, “relies on manipulative notions of altruism,” and reflects social stratification (Degli Esposti and Pavone, 2019). While donors with the most sought-after phenotypes cannot earn more money, and they do not have the agency to self-advocate in ways that US donors can, they do have a comparative advantage in accessing the limited compensation donation provides. Clinics and egg banks that can enhance their donor-recipient “matching strategies” can also recruit more business. Several clinic recruiters, for instance, report that they prioritize Romanian, Ukrainian, Russian, and other Eastern European migrant women to become donors over some groups of South American migrants. Judith B., a psychologist who works with donors at a private hospital clinic in Madrid, explains:



About 70 percent of the girls that call us [to donate] aren't Spanish. We have a very large immigrant population from South America, Latin America, and some of them come from families that are initially from Spain or Europe and we can match them, but a lot are not, so we have to turn them away. It is much easier for us to match Ukrainian or Romani donors with someone from France, for example, than it is to match someone with more Indigenous features from South America.

Aleks K. is of Ukrainian-Russian descent and donated twice at a clinic in Valencia. She describes her experience:

When I first applied to become a donor, everyone was very, very nice. And they were very nice the entire time. But some of the nurses mentioned my hair and skin color a number of times, because I'm blond and fair and they kept mentioning that, and everyone thought I was Italian or French... I was all the time aware, and I was very sure, that if I had a different skin color, they would have treated me very differently, that it wouldn't have been as easy for me.

Mr. André F., marketing director for a large Spanish egg bank, further elaborates on how socio-political events in Europe, such as the war in Ukraine, may benefit donor recruitment:

Right now, I have this impression that, from a purely financial point of view and the need to survive, we will start to see more Ukrainian women wanting to donate. They need to rebuild everything, you know? We now have many immigrants here and they are very high-demand phenotypes. When you have these Slavic phenotypes, blond, blue-eyed, etc., they will work very well for the patients we serve in Spain.

Since Spain is the primary provider of donor egg fertility treatment for intended parents coming from the United Kingdom, France, Germany, and Italy, fairer donors meet the phenotypic demands of a broader Northern European market (Bergmann, 2011; Tober and Kroløkke, 2021; Vlasenko, 2015, 2016). Clinics may also shift to recruit different groups for donation as economic conditions change. During the 2008 economic crisis, more Spanish women stepped forward to donate, pushing South American women to the edge of the market (Degli Esposti and Pavone, 2019; Lafuente-Funes, 2017). While conducting fieldwork in 2022, several professionals in clinics throughout Spain told Tober about their growing pool of Ukrainian donors.

## Vitrification and shifting bioeconomies in the United States and Spain

Advances in egg freezing technologies have revolutionized the egg donation industry (Cooper and Waldby, 2014; Inhorn, 2017; La Marca et al., 2020; Nahman, 2011, 2018; Pavone and Goven, 2017; van de Wiel, 2020; Waldby, 2015, 2019). The ability to freeze and store oocytes has profound implications for reproductive bioeconomies and oocyte distribution in both the United States and Spain and amplifies global fertility cold chains (Waldby, 2019; Vertommen et al., 2022). As Spanish embryologist Dr. Paco G. explains:

I believe that [vitrification] has been the greatest change, or one of the greatest changes. that has taken place in the last decades in the field of reproduction... It allows us to have a much better survival rate, but above all it allows us to preserve fertility. Right? Freezing eggs that you couldn't before.

Examining the shift in fresh versus frozen donor egg cycles since 2015 illuminates the degree to which vitrification has affected practice. According to data from the Spanish Fertility Society, in 2015 there were a total of 12,542 donor oocyte retrievals performed in Spain and a total of 207,324 oocytes obtained, of which 32,132 oocytes (15.9 percent) were vitrified (SEF 2015). In 2019, 14,521 donor oocyte retrievals were performed, 284,875 total oocytes obtained, and 78,016 (27.4 percent) oocytes were frozen (SEF 2019). Not only did the percentage of frozen donor oocytes nearly double, but also the mean number of donor oocytes retrieved per cycle increased from 16.6 to 19.6 (SEF, 2015; SEF, 2019). Unfortunately, comparable data for the United States is unavailable. Data compiled in the annual Centers for Disease Control and Prevention (CDC) Assisted Reproductive Technology reports do not specifically track egg donor cycles. Yet, from 2013 to 2015, within two years following the ASRM decision to remove the experimental label from oocyte vitrification (ASRM, 2013), available US data does demonstrate that the reported use of cryopreserved donor oocytes in IVF cycles increased by 44 percent and the use of fresh donor oocytes decreased by 32.9 percent (CDC ART Reports, 2016; Kushnir et al., 2018).

Vitrification enables new business models for oocyte distribution. In Spain, prior to the emergence of oocyte vitrification, while many clinics did have their own internal frozen egg banks, the banked oocytes were primarily reserved for local and international patients who came to the clinic for treatment. In Spain, donor oocytes have long been considered the property of the clinic, not the intended parents, and the cost of an IVF cycle with donor eggs ranges between EUR 6000 and EUR 11,000, with an average cost of EUR 8000. Once vitrification techniques improved, enabling better survival rates for thawed eggs, frozen egg banks began to emerge and operate in ways that did not exist before. Now, independent egg banks can expand their global reach by shipping batches of eggs internationally in cryogenic tanks, allowing them to operate in parallel ways to sperm banks. This means that egg donors in Spain are now recruited to reach an even wider—predominantly European—market and egg banks must increase their supply of donors with specific phenotypes to meet this demand. This market expansion magnifies how “white desirability,” as Amrita Pande (2021) discusses, manifests in the recruitment of egg donors for the transnational fertility industry, where phenotypic matching between donors and recipients is required but perceived by professionals as “objective” and “based in science.”

Unlike in Spain, in the United States, donor eggs have typically been the property of the intended parents who paid the egg donor fee. In the United States, a single IVF cycle with frozen donor eggs costs on average about USD 22,000, depending upon the clinic—about double the cost as in Spain. Until recently, the use of frozen donor eggs in fertility treatment was relatively rare compared to the use of fresh oocytes due, in part due to lower success rates. Since the ASRM removal of the “experimental label” for oocyte vitrification, US fertility clinics have begun to offer their patients a range of options for procuring donor eggs. A one-to-one cycle is the traditional egg donation model when a single donor is matched to a single intended parent who will receive all the fresh oocytes the donor produces on that donation cycle, which will then be fertilized to become embryos. A “shared cycle” is when the donor and recipient, or two recipients, split the batch of oocytes the donor produces at reduced cost. In shared cycles, the oocytes can be used either fresh or frozen, or some used fresh, and the remainder vitrified for later use. Oocyte vitrification enables new distribution models; donor oocytes can now be frozen, banked in batches of five or six, and sold to multiple recipients at different points in time. For clinics and egg banks, this expands the reach of a single oocyte donor from one recipient per donation cycle to many. For intended parents, buying a batch of five or six eggs appears to be the most affordable option. Based on data compiled from a typical California clinic with an internal egg bank program, Table 2 below demonstrates three possibilities for oocyte distribution available in the United States, respective costs for intended parents, and how potential clinic income per donation cycle changes accordingly.

Table 2 demonstrates how clinic revenue can increase substantially under the egg banking system—revenue that continues to expand according to the number of eggs a donor produces per cycle. For egg bank programs, there is an obvious financial benefit to higher egg yield, shared cycles, and bundling

TABLE 2 US: Three scenarios for oocyte distribution, costs, and profit potential over a single egg donor cycle at a Southern California Clinic

Cycle Type	1 donor / 1 intended parent (IP)	Shared (1 donor / 2 IPs)	Banked/frozen 1 donor / multiple IPs
IP cost (recipient)	USD 41,000	USD 30,000 × 2 = 60,000	USD 22,000 × 6 = 132,000
# Eggs	30	30/2 = If 2 IPs, 15 each	30/6 = 6 batches of 5
Donor fee	USD 7500	USD 7500	USD 7500
Total to clinic	USD 33,500	USD 52,500	USD 124,500

Source: Data compiled by The OVADO Project

oocytes into batches for wider distribution. Lucy V., program director of a California egg donation agency and egg bank, explained how egg freezing and donor egg quantity affect her business.

**Lucy V.:** We just had this donor who produced 78 eggs ...

**Diane Tober:** Wow!

**Lucy V.:** Yeah, and that was like a home run for us! Each of the three sets of IPs received a batch of five and we just heard that each of them got pregnant. So now we have a bunch frozen in batches and another couple just came in and said, “Wow. Three pregnancies? I want to use those eggs!”

Using the same formulas as in the above table, if an egg donor produces 78 eggs, the egg bank could bring in as high as USD 354,000 from a single donor cycle. For egg banks, high-producing donors are particularly appealing from a business standpoint. For donors, however, the more aggressive stimulation protocols that enable higher quantities of eggs to mature are also associated with greater risk for complications such as ovarian hyperstimulation syndrome (OHSS) and ovarian torsion, which may require removal of the ovary. Risks for severe OHSS—potentially a life-threatening condition—appear to increase according to the number of eggs produced in a given cycle (Tober et al., 2020). Indeed, the Institute of Medicine recommends that cycles be canceled when a donor produces greater than 20 eggs, due to increased risk for severe ovarian hyperstimulation syndrome (Institute of Medicine, 2006). But rarely do clinics cancel donor cycles, regardless of a donor’s response to the follicle stimulating hormone medications.

Leena, a university-educated US donor of Asian ancestry, donated her eggs four times, starting at age 19. Her first three cycles were done through a local private clinic, but her fourth was through an egg bank. She explains:

They said they wanted to freeze my eggs and split them up between different sets of intended parents, to make it more affordable for them and pay me 6500 [dollars]. For my first few cycles I produced about 30–32 eggs, and I felt ok. But then my fourth [for the egg bank] was like over mature 40 eggs. It was a ridiculous amount, and I was really uncomfortable. My abdomen was really swollen, and I was in a lot of pain for the next week. I decided I was done after that.

Later in the interview, Leena also remarked that she felt like the egg bank treated her as if she had “low budget eggs” compared to her more positive experiences at the private clinic, where she felt more valued. Like Leena, other US donors surveyed and interviewed repeatedly expressed concern about the high quantity of oocytes they were stimulated to produce, reported feeling as if the clinics disregarded their concerns, and reported feeling like they were treated as “cash cows” or “egg machines.”

In contrast, most donors surveyed and interviewed in Spain were not able to provide any information on how many eggs were retrieved on any given cycle and had no information on how their eggs were

being distributed. Angela, a three-time donor, is one of the few who said she asked the nurse in the recovery room, but did not get the response she was hoping for:

I asked the nurse how many eggs they took from me, but she told me that wasn't information I needed to know because the eggs aren't mine and they can't tell me because donation is anonymous. She just told me, "You had a lot."

In Spain, the options for oocyte distribution take a different form than in the United States. Within clinics some donation cycles follow a hybrid model: a portion of the donor oocytes retrieved will be used in an immediate fresh IVF cycle for a single recipient or embryos created and then frozen and any surplus oocytes will be frozen and distributed to other recipients later. Other times a "freeze all" approach is taken, where all the oocytes a donor produces will be frozen and distributed to recipients later or possibly shipped abroad. In most cases, in clinics that have internal egg donation programs, the decision to either freeze all or follow a hybrid model depends upon both whether there is a donor who is an immediate match for an intended parent and the number of oocytes the donor produces. In Spain, it is practically unheard of for an intended parent to receive or preserve all the oocytes a donor produces. As one Spanish donor coordinator stated:

When you contract, you contract the normal egg donation or the basic egg donation. Basic egg donation guarantees you four fertilized eggs. And if a donor produces many eggs, we take what is left over and use them for other patients.

Vitrification enables global distribution of oocytes across borders. Clinics and egg banks in Spain have long practiced egg freezing and banking, but improved oocyte survival rates with vitrification has enabled business expansion, especially in the form of shipping frozen eggs across borders. This global mobility of oocytes influences which donors are selected. The United States entered the egg banking market comparatively recently. Unlike Spain, where frozen eggs are the norm and of equal value, in the United States egg bank donors are often considered in a different class than donors who provide for one-to-one cycles; frozen eggs are less expensive than fresh, and egg donors to egg banks often get paid much less than donors who provide eggs through private agencies and clinics, where they have more power to negotiate. Indeed, some egg bank donors express feeling like they're treated as "low budget," and many express concerns that they are intentionally being hormonally stimulated to produce higher quantities of eggs and at greater risk to their health.

## CONCLUSION

This foray into two different bioeconomies represents a case study of how "global economies are built upon biotechnological manipulation" of gametes and bodies in different ways (Pavone and Goven 2017:9) and how regulatory systems differentially influence the parameters of practice. By demonstrating how different cultural and regulatory contexts intersect with donor selection and egg donors' embodied experiences, we contribute to anthropological discussions surrounding biocitizenship, power, and agency (Pande and Moll, 2018). As have other authors, we have focused on the practices of egg donation in different cultural settings to explore how bioeconomies capitalize on economic inequalities and phenotypic stratification (Daniels and Forsythe, 2012; Deomampo, 2019; Namberger, 2019; Perler and Schurr, 2021; Tober and Krøløkke, 2021). Fertility patients using donor eggs tend to be affluent and predominantly lighter-skinned people from around the globe (Keehn et al., 2015; Speier, 2016; Whittaker and Speier, 2010). Our analysis demonstrates that donor selection can vary according to the regulatory context: in both Spain and the United States, donors are chosen to match the clinic's fertility patient profile, but only in the United States are donors chosen—and paid more—

because they are selected and marketed to appeal to consumer desires. In exploring the ways that gendered eugenic principles come into play in the different recruitment processes, our research provides evidence for how “selective pro-natalism” operates in different ways (Ginsburg and Rapp, 1996; Thompson, 2005).

By eliminating the ability for intended parents to directly select their own donors, and putting donor selection in the hands of physicians, Spain upholds medical authority but also avoids the blatant competition among recipients for high-demand donors. The Spanish model mitigates some of the ethical challenges that accompany financially driven biohierarchies that arise when some women’s eggs are deemed more valuable than others (Daniels and Heidt-Forsythe, 2012; Deomampo, 2019). At the same time, compared to the United States, caps on donor compensation in Spain limit the degree to which donors can financially benefit or self-advocate, while the industry continues to flourish. In the United States, where free enterprise and consumer choice are prioritized, the market for human eggs reflects broader cultural-corporate principles, having a direct impact on young women as egg producers, and exacerbates iatrogenic conditions. Some oocyte donors in the United States can negotiate their compensation and terms in ways that donors in Spain cannot. But in this highly commodified system, gendered eugenics is magnified. Finally, in the United States oocyte vitrification magnifies the commodity quality of oocytes and leads to a system in which donors are often stimulated to produce higher quantities of oocytes, often at greater risk to their own health.

By comparing egg donation in the United States and Spain, we illuminate how reproductive bioeconomies reflect global capitalist systems and operate through individual bodies in different cultural and regulatory contexts. Our analysis provides insight into the cultural and ethical underpinnings of reproductive policy and practice and how these are played out in clinical settings.

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## ENDNOTE

<sup>1</sup> At the time of this writing EUR 1100 equals approximately USD 1300 US. See <https://fiscaldata.treasury.gov/datasets/treasury-reporting-rates-exchange/treasury-reporting-rates-of-exchange>. In 2022, the Spanish minimum wage was EUR 1000/month (see: <https://www.statista.com/statistics/456403/spain-national-minimum-wage-monthly>).

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