

Together. All the way™

OVOIL HEAVY

- Research summary





A new level of safety

OVOIL HEAVY is not just any other oil. It is the world's first synthetically derived paraffin oil – developed, manufactured, tested, and certified specifically for clinical IVF. With consistently high lot-to-lot quality and increased viscosity, **OVOIL HEAVY** provides exceptional safety for your embryo culture while improving handling qualities in the lab.

All the best properties combined – in one bottle

OVOIL HEAVY is a new product providing different handling properties compared with lighter oils. It is a heavier synthetic paraffin oil, made by polymerization of short chain alpha-olefin molecules. Its composition is defined during production, and it contains the lowest possible levels of potentially embryotoxic impurities. Therefore, OVOIL HEAVY ensures decreased amounts of volatile organic compounds (VOCs) and the least possible lot-to-lot variation. OVOIL HEAVY is twice as viscous as classic OVOIL, granting it attractive handling properties.

Comfortable handling for embryologists

OVOIL and OVOIL HEAVY are both high-quality culture oils, granting protection to the embryo culture system. They have different viscosities, which gives you a choice between using a more fluid or a thicker oil for any procedure in the IVF lab. OVOIL HEAVY's high viscosity helps minimize spillage during dish preparation and transfer. In a survey of 40 embryologists from 6 countries, more than 80% of the respondents pre-ferred the handling of OVOIL HEAVY compared to the oil they were currently using⁷.

Over 70% of the respondents would recommend OVOIL HEAVY to a colleague. Feedback on the positive qualities of OVOIL HEAVY was associated with the ease of pipetting, ease of covering droplets, handling of culture dishes with media and oil, and reduced oil spilling/dropping during manipulations⁷.

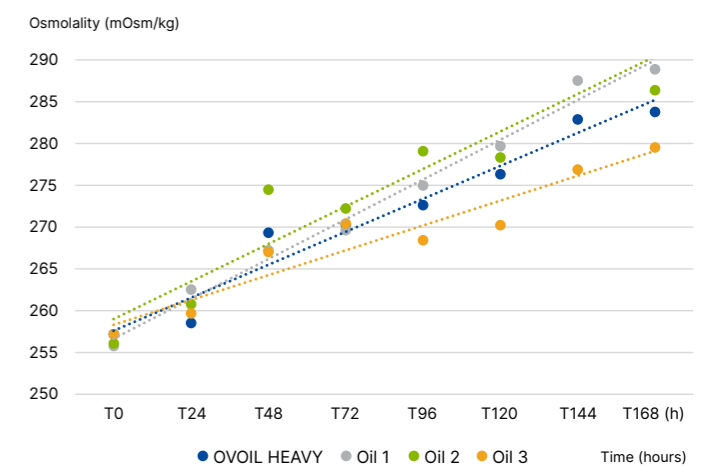
Uninterrupted embryo culture

OVOIL HEAVY's excellent in vitro culture properties differentiate it from other viscous oils and extends the exemplary characteristics of classical OVOIL.

Culture media can evaporate even under a layer of oil; therefore, the properties of the oil covering are crucial for successful culture in vitro.

The longer the culture period, the more important this may become since the osmolality of culture media can change significantly during one-step uninterrupted culture. Incubation in a dry atmosphere influences the rate of water loss and causes a greater change in osmolality of the culture medium than incubation in a

Figure 1 Osmolality changes over time



humidified atmosphere, even when the culture dish is covered with the lid². More viscous oils reduce evaporation and, therefore, can safeguard osmolality and pH more effectively^{1,3}.

Figure 1 shows that when OVOIL HEAVY was compared to 3 other oils in a dry incubator, it was found to mini-mize the increase in osmolality. The smallest changes in medium osmolality after 7 days of incubation were observed in the more viscous oils (OVOIL HEAVY and Oil 3: <25 centipoise at 30°C) compared to less viscous oils <40 centipoise at 30°C).

Importantly, both OVOIL and OVOIL HEAVY provide efficient protection against changes in osmolality, with classical OVOIL being as effective as a heavy oil by another manufacturer⁴.

“...When comparing OVOIL HEAVY to former oils I felt it offers me as an embryologist many handling benefits. I like the viscosity, how easy it is to pipette and there is much less spilling when using it.”



– Van Pham, Chief Embryologist at Aspire Fertility in Houston, The Prelude Network

[Read Van's full testimonial here](#)



Although OVOIL HEAVY has a high viscosity, Figure 2 shows that no extra incubation time is required to equilibrate the medium when compared to more liquid culture oils.

Safeguarding the highest possible embryo quality

How can any culture oil improve embryo development? The simple answer is it can't, but if the oil quality is sub-optimal, it can decrease embryo development. Most oils are produced from petroleum, which means that embryotoxic components may be present due to the production process and origin of the raw materials. Embryotoxins can affect embryo development. In a comparison between four IVF oils, mouse embryo culture with OVOIL HEAVY led to a significantly higher number of blastocysts compared with three other brands (Figure 3).⁸

Furthermore, blastocysts cultured using OVOIL HEAVY overlay had significantly more cells than those cultured with other tested oils (Figure 4a, 4b).⁸

This is important because the more cells a blastocyst has, the greater its developmental potential⁵. Blastocyst cell number is also a sensitive indicator of a sub-optimal component⁶. At Vitrolife we dedicate specific attention to the scrupulous quality testing of all our products and have developed a very sensitive MEA test for culture oils.

Both OVOIL HEAVY and OVOIL undergo specifically sensitive microdroplet MEA tests (Figure 5): individual 1-cell mouse embryos are cultured in a 2 µL drop of a simple salt solution with albumin under oil.

This increment in the surface-to-volume ratio increases the sensitivity of the assay⁶. Raw materials for oil

production and containers for raw material delivery also undergo standard MEA testing.

Only oil which passes all MEA tests during several production steps is cleared for distribution. Such rigorous testing results in the release of an oil, which is perfectly suited for human embryo culture, ensuring the best possible protection of your culture system. In addition to MEA tests, both OVOIL HEAVY and OVOIL undergo a Human Sperm Oil Assay – a functional test with human spermatozoa, aimed at detecting any possible remnant toxins to provide an extra guarantee of the product's safety.

Figure 5 For the microdroplet MEA test of OVOIL and OVOIL HEAVY, small drops of just 2 µL are used instead of standard 20 µL

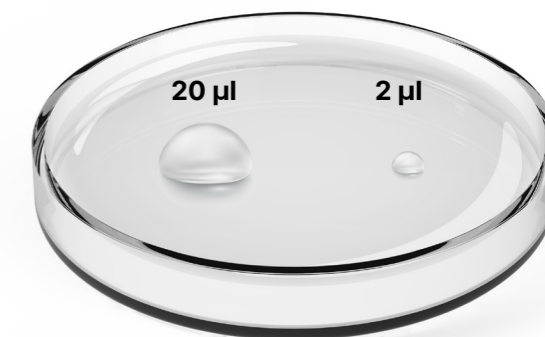


Figure 2 CO₂ equilibration profiles

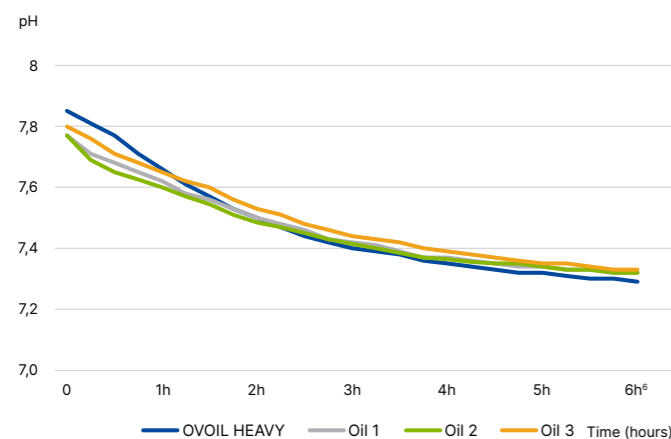
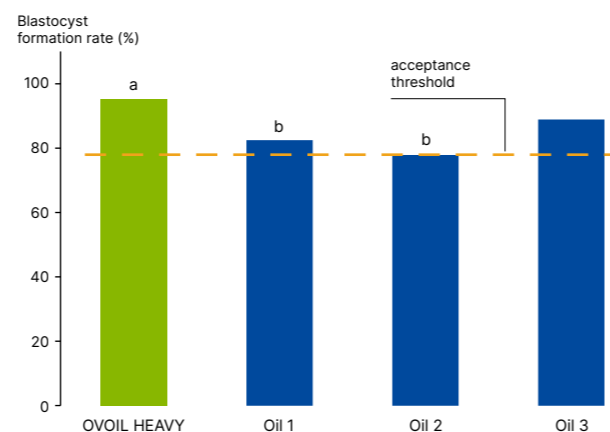
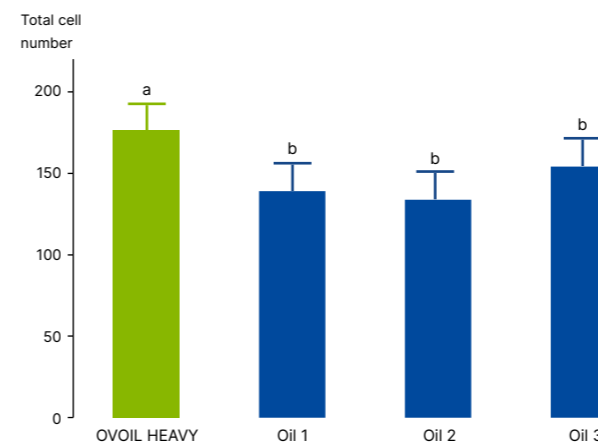


Figure 3 Embryo development data



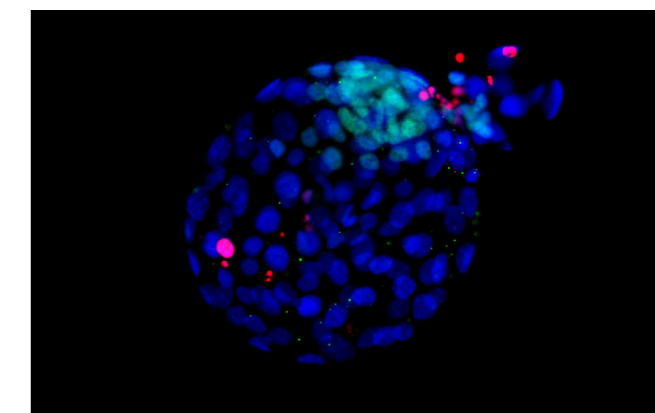
Significant difference is denoted with letters a and b.

Figure 4a Blastocyst cell count



Significant difference is denoted with letters a and b.

Figure 4b



Mouse blastocyst after immunostaining for nuclei of trophectoderm cells (blue) and inner cell mass (green) as a part of extensive MEA testing.



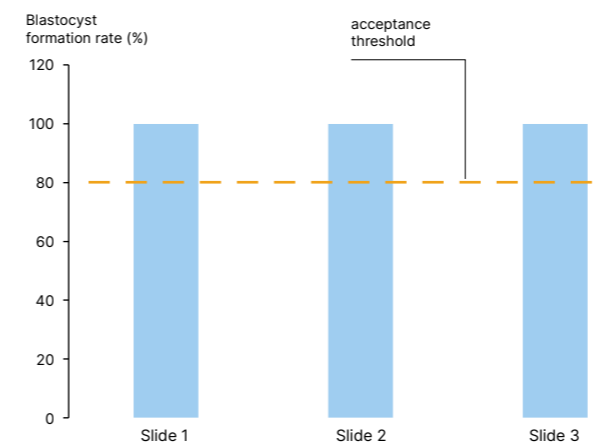
“... OVOIL HEAVY met all our expectations and we decided to switch from the regular OVOIL to the heavy version.”



**– Dr. Frida Entezami,
LabManager of American
Hospital of Paris**

[Read Frida's full testimonial here](#)

Figure 6



OVOIL HEAVY is the perfect addition to Vitrolife's embryo culture system. Experimental data from mouse 1-cell embryo culture, showed a 100% expanded blastocysts rate after continuous incubation for 96 hours in the EmbryoScope+ (non-humidified incubator) in ambient oxygen (Figure 6), with only a marginal increase (mean 3.8%) in osmolality over the entire culture period (Figure 7).⁸

Figure 7

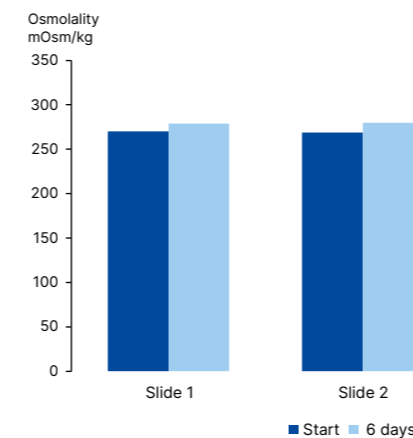
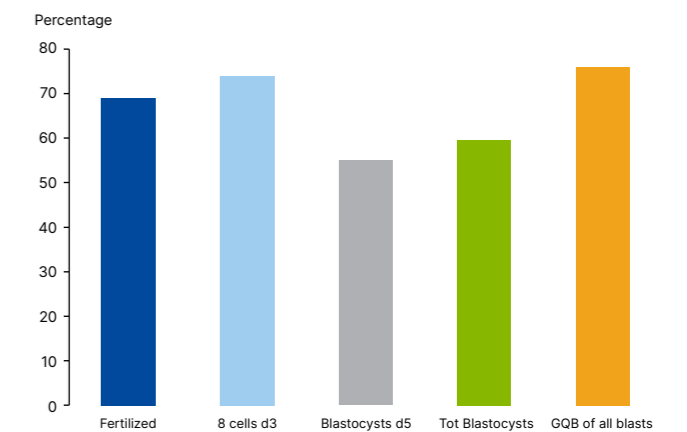


Figure 8



In this experiment, incubation time was prolonged to provoke an increase in osmolality and ambient oxygen was used to add extra stress to the culture system. Despite these conditions, osmolality was controlled, and all embryos reached expanded blastocyst stage. Clinical data from 5 clinics (including 1,230 oocytes from 121 patients), showed a total blastocyst rate of 60%, of which 76% were good quality blastocysts (Figure 8).⁷

Let OVOIL HEAVY protect your embryo culture

- OVOIL HEAVY can make routine embryology procedures easier to handle thanks to its higher viscosity.⁷
- OVOIL HEAVY can safeguard the culture media properties by decreasing fluctuations in osmolality and pH.⁸
- OVOIL HEAVY and OVOIL are rigorously tested using the sensitive micro-droplet MEA test and Human Sperm Oil Assay.⁶
- OVOIL HEAVY is a very safe product, ensuring excellent embryo development.⁶
- OVOIL HEAVY greatly contributes to a successful treatment outcome for each of your patients.⁷



Visit our product site to learn more about OVOIL and OVOIL HEAVY

➤ To learn more about how Vitrolife can make a difference and to follow the latest science and discussions on our blog, visit blog.vitrolife.com

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