

Managing Figure Size and Resolution for Print and Screen

Consider the following typical scenario. You are submitting a paper and the style journal states requirements as listed on the right. Let's see how we would satisfy these conditions.

Ideally, when thinking about the size of any element on the page you should be thinking in points (1 pt = 0.353 cm). This is the common unit for sizing text and line thickness and naturally extends to other elements. For larger elements such as figure size or table, using centimeters or inches is practical but always keep the conversion to points in mind.

The requirements allow for a maximum figure width of $W = 595 - 2 \times 72 = 451 \text{ pt} = 6.26 \text{ in} = 159 \text{ mm}$. Begin with making an artboard in Illustrator of this size, with initially an arbitrary height (e.g. $3W$). Place your elements and assign them to layers based on role (e.g. title, axes, grids, data traces etc). Always make data traces thicker than axes or grids by at least 50% or even 100%. A good ratio is 0.5 pt axis and 1 pt data trace (feed intake panel). Keep line width at least 0.5 pt. Very thin lines (e.g. 0.25 pt grid, 0.5 pt data as in albumin height panel) don't have strong presence on the page.

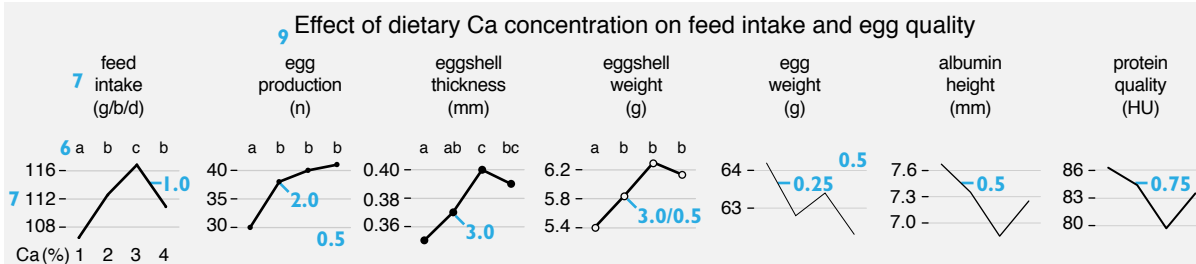
TYPICAL JOURNAL STYLE AND FIGURE REQUIREMENTS

- A4 paper (210 mm wide)
- 1 inch margins
- EPS line art figures
- PNG/TIFF bitmaps >300 DPI
- 0.25 pt minimum line width
- 6 pt minimum font size

UNIT CONVERSION

210 mm = 595 pt

1 pt = $1/72 \text{ in} = 25.4/72 \text{ mm}$



9 Figure 1. The grey box is 451 pt (159 mm) wide. Text size and line thickness shown in points—various combinations are used in panels to demonstrate the effect of contrast between data and grids.

Print the figure on A4 paper and verify that all elements are easily visible and that the data stands out. Save the figure as EPS and you have a submission-ready file. Export the file as a 300 dpi PNG (always check "Use artboards") and use "art-optimized". This will give you a 1,879 pixel wide image, suitable for use on slides or the screen. Even if the bitmap is used and mapped onto 451 point width of the figure, the output will not be too pixelated (see left), because we're getting 300 pixels per inch (4.2 pixels per point).

However, if you down sample the image to 450 pixels wide (72 pixels per inch, below) the output will be very pixelated. That's because we now only have 1 pixel per point!

Ideally, even if the journal asks for 300 DPI, render all artwork at 600 DPI or higher. Always interpret DPI (dots per inch) as PPI (pixels per inch)—it's the pixel of the image that's relevant here not the printed "dot", from which the term traditionally oriented.

