



# GFI startup survey results

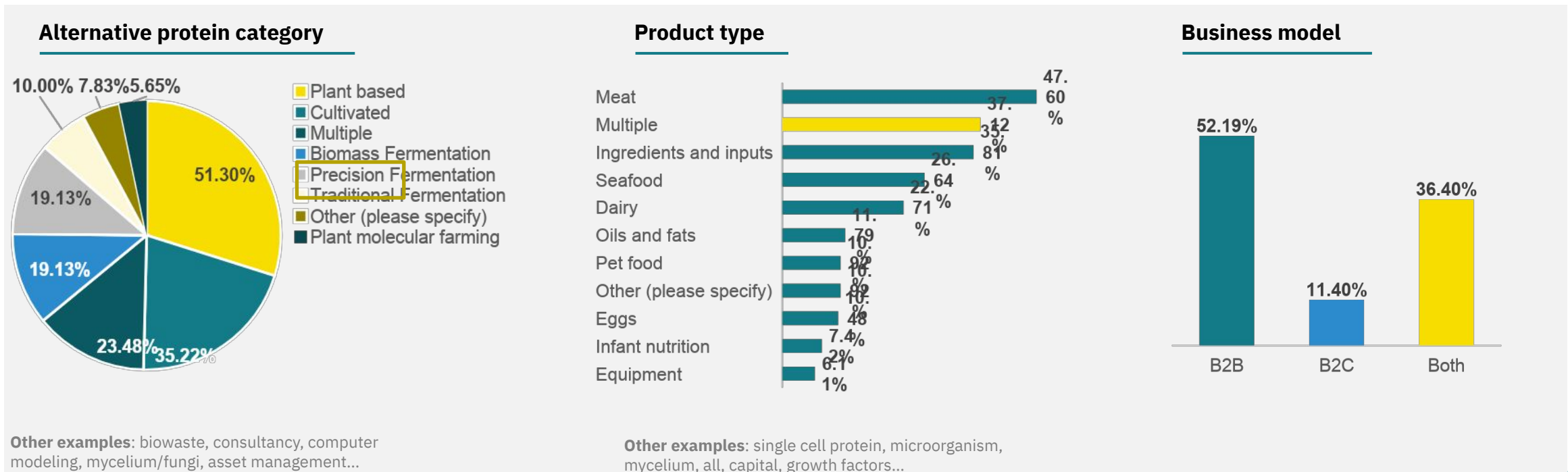
Oct 2022



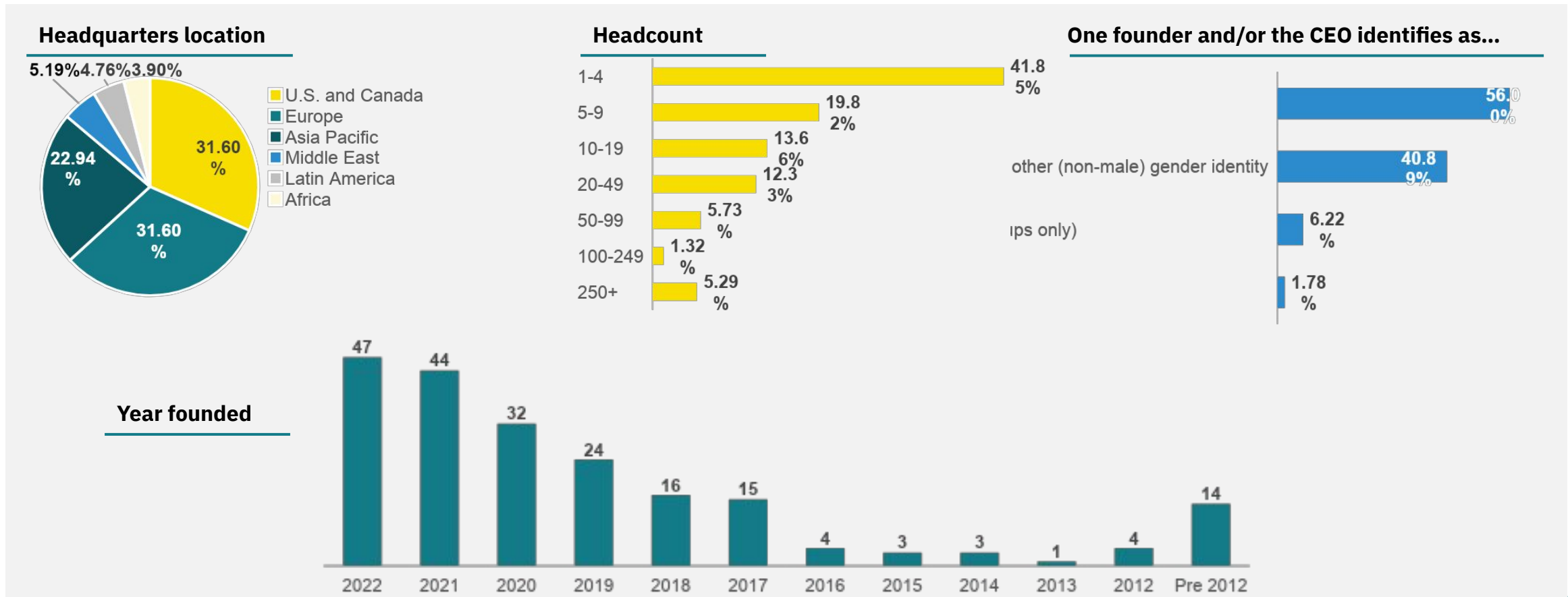
# Survey and participant overview

**Background:** GFI asked alternative protein startups to respond to a survey about the state of their companies, fundraising needs, business challenges, and where GFI can help in **September to October 2022**.

**Responses:** 234 participants in total



# Survey and participant overview cont.



# Fundraising - amount raised to date

Fundraising amount raised to date (\$USD)	
Total	\$1,044,774,750
Median	\$700,000
Average	\$9,497,952
Count	110

Top **10**/110 responses account for **81%** of total reported fund raised

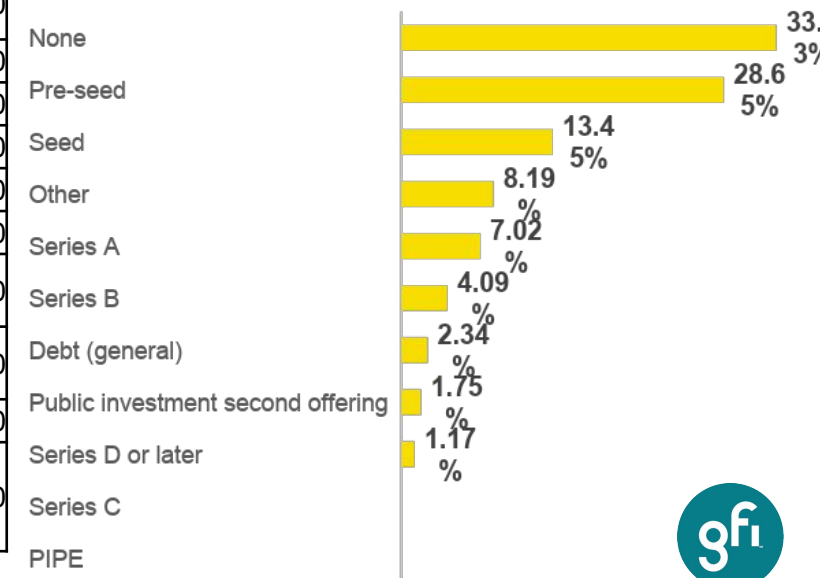
**3** responses **\$100M+** including one **\$345M**

Headquarters	Fundraising amount raised to date (\$USD)
U.S. and Canada	\$737,589,500
Asia Pacific	\$204,936,750
Europe	\$66,363,500
Middle East	\$22,550,000
Africa	\$7,235,000
Latin America	\$6,100,000

Alternative protein category	Fundraising amount raised to date (\$USD)
Plant-based & Fermentation	\$359,359,000
Plant based	\$202,302,250
Plant molecular farming	\$109,875,000
Cultivated	\$82,216,500
Cultivated & Fermentation	\$80,050,000
Plant-based, Cultivated, & Fermentation	\$77,000,000
Plant based & Cultivated	\$47,190,000
Precision Fermentation	\$33,930,000
Fermentation (multiple)	\$25,950,000
Other	\$12,033,000
Biomass Fermentation	\$8,340,000
Cultivated & Plant molecular farming	\$5,000,000
Fermentation & Plant molecular farming	\$1,000,000
Traditional Fermentation	\$500,000
Plant-based, Cultivated, Fermentation, & Plant molecular farming	\$29,000

Business model	Fundraising amount raised to date (\$USD)
B2B	\$580,642,500
B2C	\$234,491,500
Both	\$229,640,750

## Last round raised

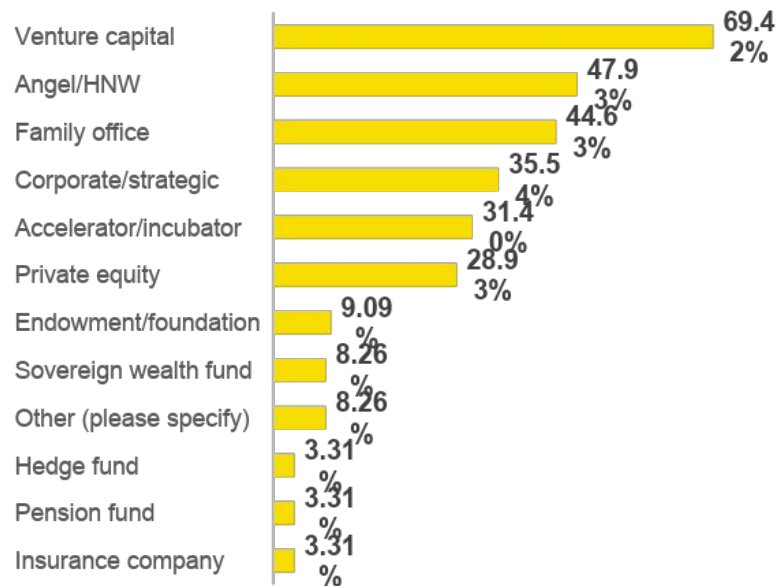


Other examples: bootstrap, grant, pre-A, partner company...



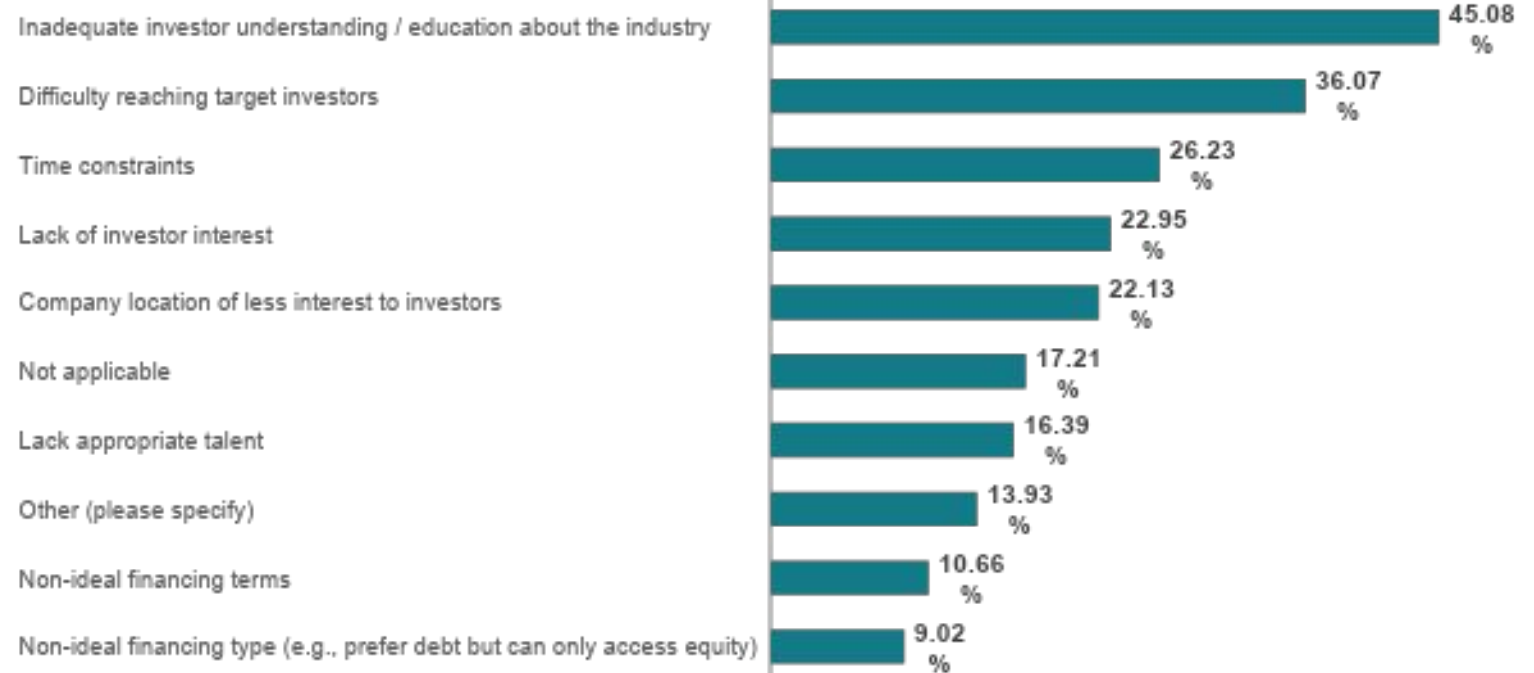
# Fundraising – desired investors & challenges

## Sought-after investor types



Other examples: grants, impact fund, social impact investors, equipment financing companies...

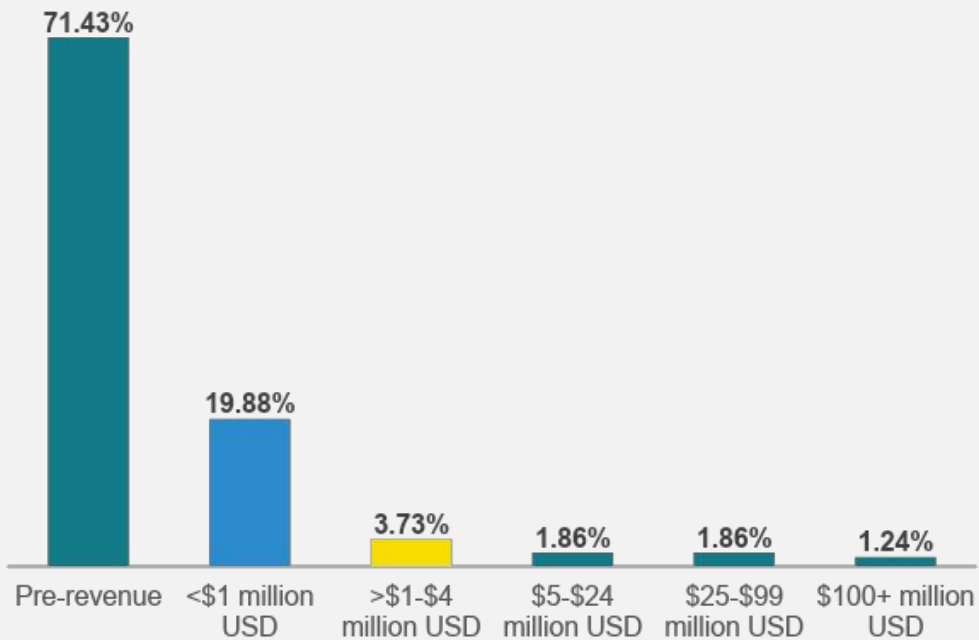
## Top fundraising challenges



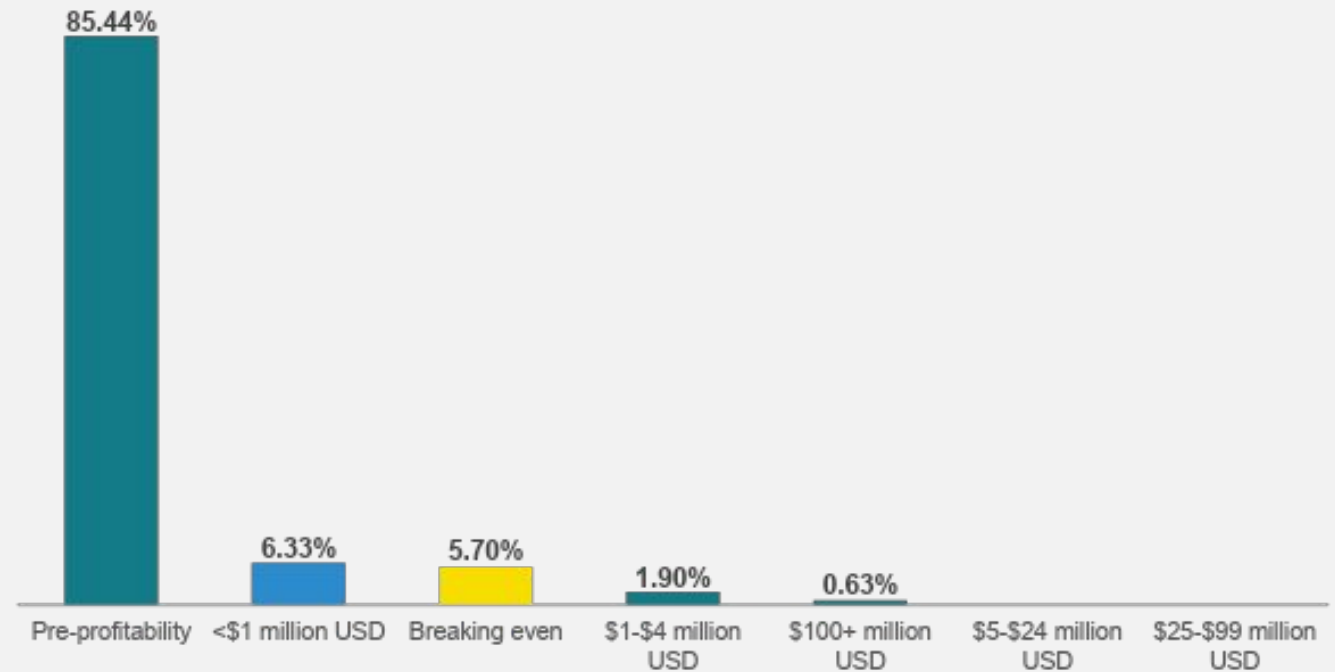
Other examples: lack of traction, lack of understanding, investor bias, economic downturn...

# Revenue and income

Trailing 12-month revenues

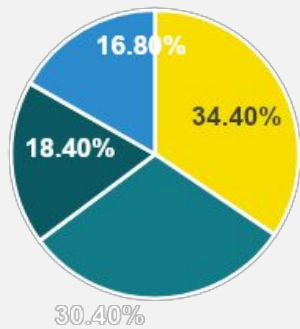


Trailing 12-month net income



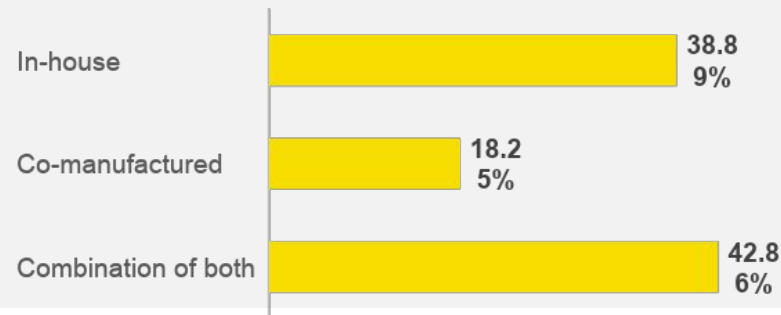
# Manufacturing

## Production stage

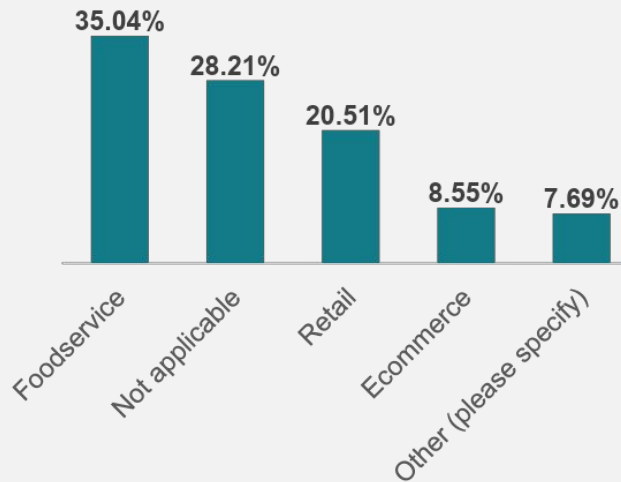


- Lab
- Pilot (sampling and/or research batches)
- Demo (process development for full-scale production)
- Commercial (full-scale production)

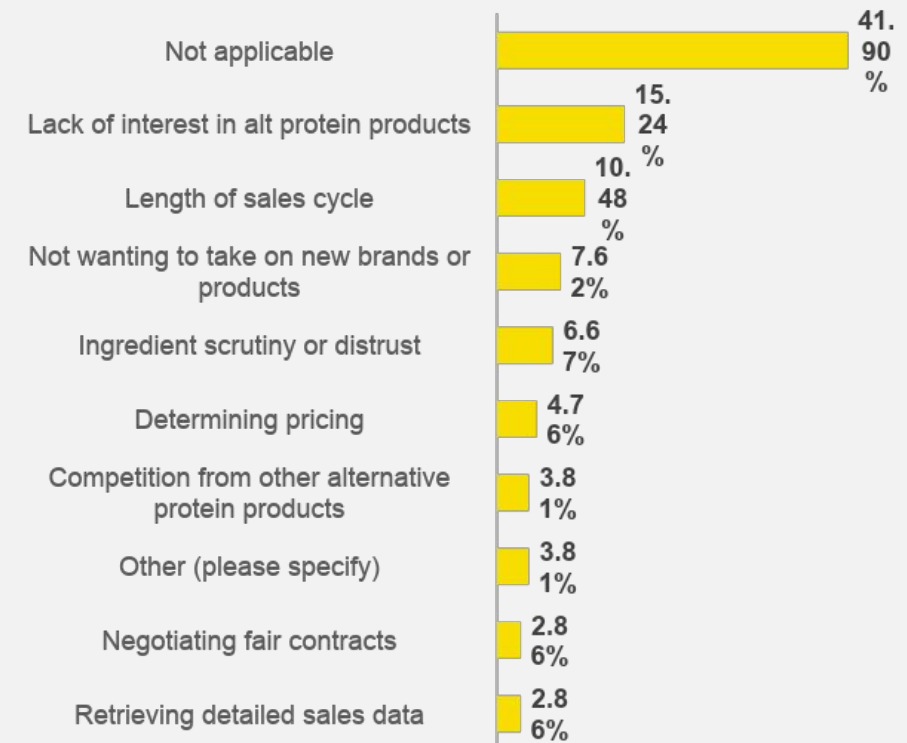
## Manufacturing approach



## Priority when launching products

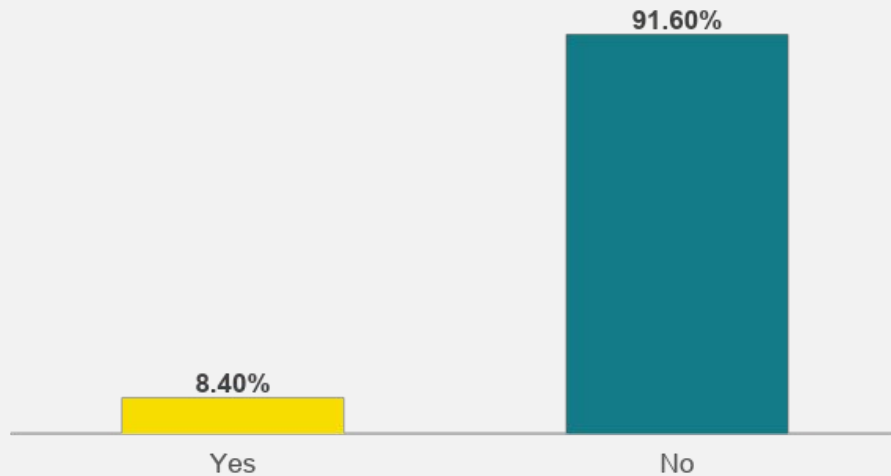


## Challenges working with distributors, foodservice operators, and/or retailers

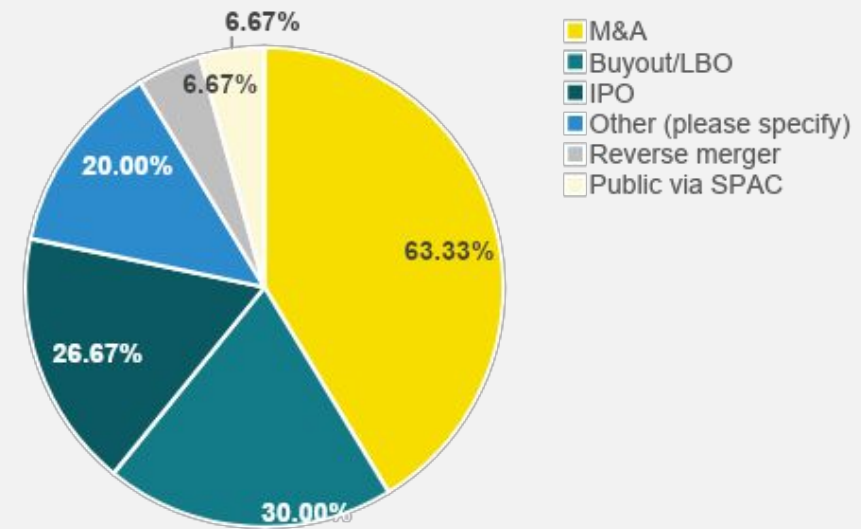


# Exit opportunities

Seeking exit opportunity or liquidity



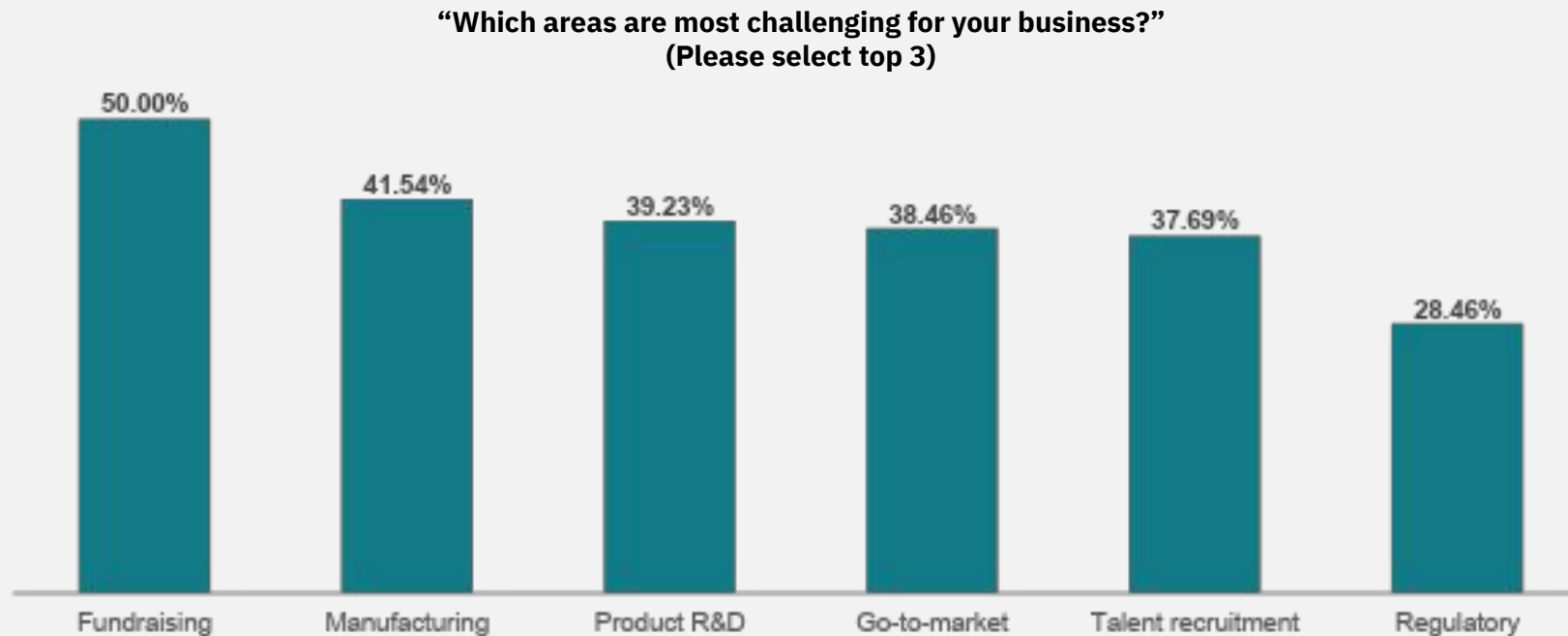
Type of exit opportunity/liquidity event



Other examples: not applicable or unknown

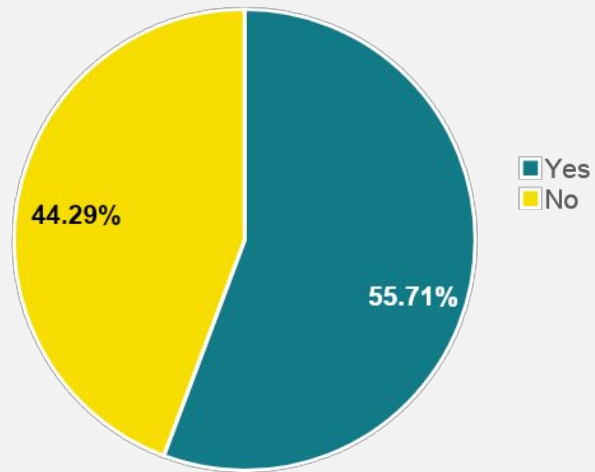


# Biggest challenges

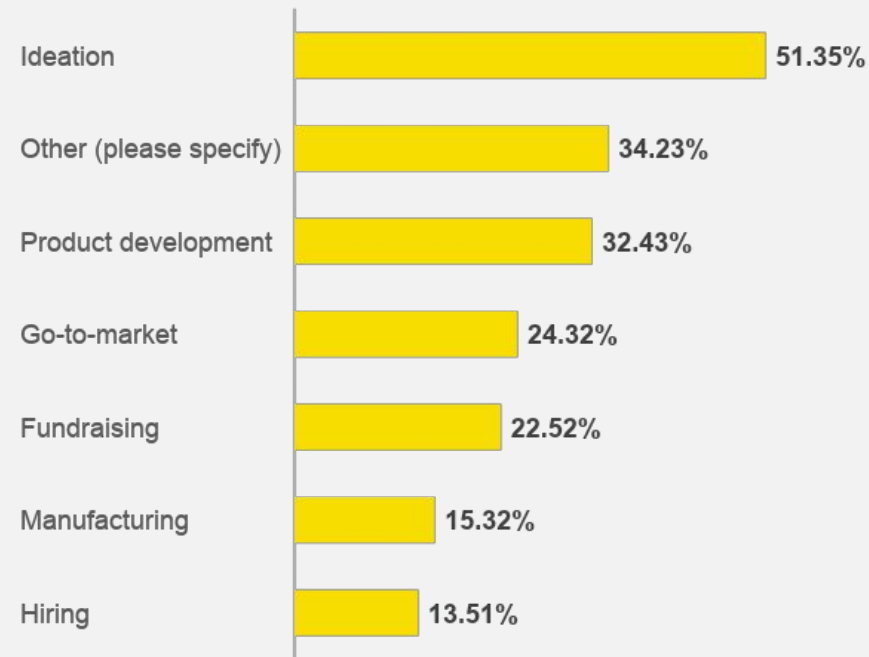


# GFI's influence

## Has GFI helped you in building your company?

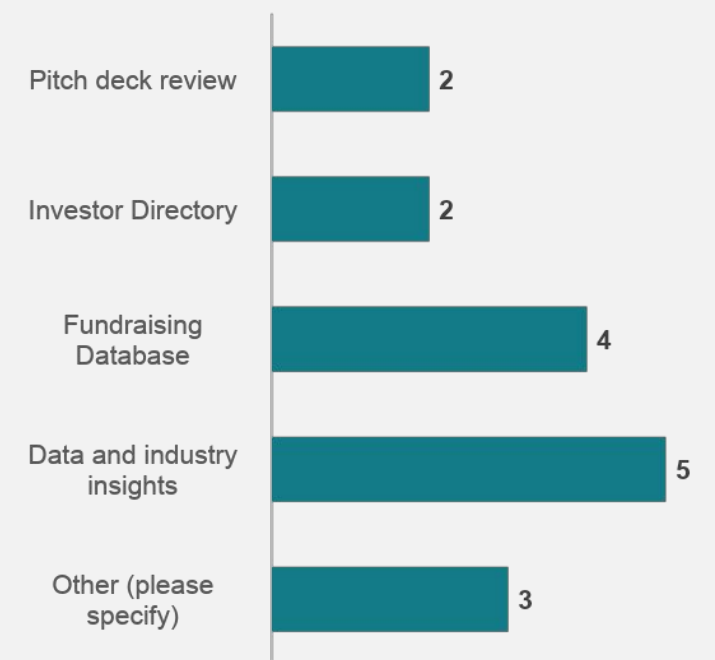


## Which areas has GFI helped?



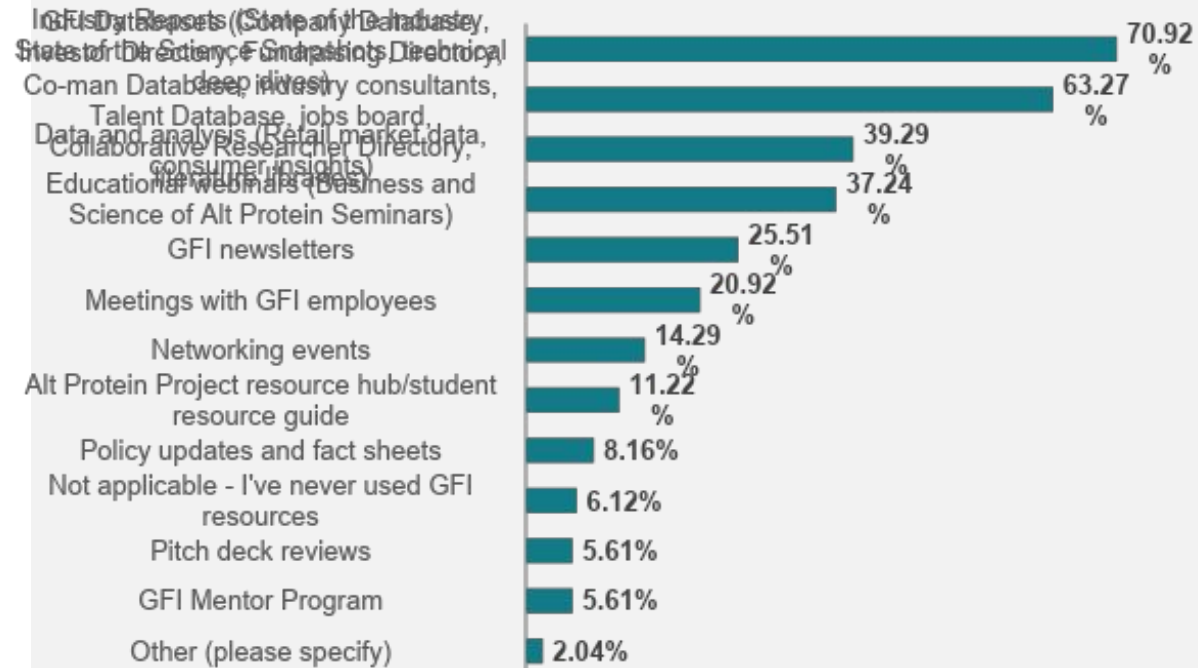
Other examples: networking & connections, market trends, education, research resources...

## Which fundraising resources have helped?

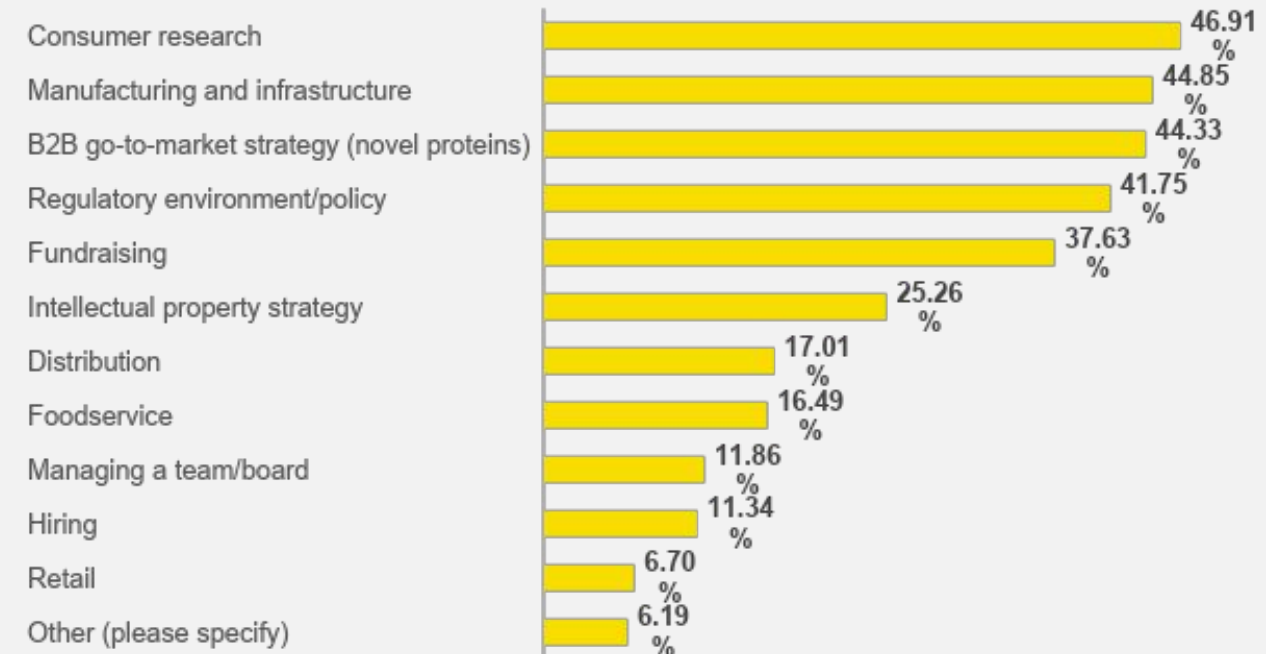


# GFI's influence cont.

## Top GFI resources



## Resources for GFI to increase focus



Other examples: category specific market data, sourcing inputs, business validation, B2B focus, foodservice data

# Additional Slides/Data Points



# Fundraising – future 12-month goals

	Total 12-mo fundraising goals	Percent of total
Series C	\$585,005,000	38%
Series B	\$419,150,000	27%
Series A	\$367,250,000	24%
Seed	\$92,300,000	6%
Pre-seed	\$27,080,000	2%
Series E or later	\$20,000,000	1%
Other	\$6,120,000	0.4%
Equipment financing	\$5,730,000	0.4%
Debt (general)	\$5,120,000	0.3%
Project financing	\$2,110,000	0.1%
Public investment second offering	\$400,000	0%
Series D	\$150,000	0%
Other specialty financing	\$2,000	0%
PIPE	\$0	0%
<b>Total</b>	<b>\$1,530,417,000</b>	<b>100%</b>

Alternative protein category	Total 12-mo fundraising goals
Cultivated	\$779,890,000
Plant based	\$153,210,000
Plant-based & Fermentation	\$152,050,000
Biomass Fermentation	\$144,600,000
Precision Fermentation	\$136,800,000
Plant based & Cultivated	\$59,175,000
Other	\$53,500,000
Plant-based, Cultivated, & Fermentation	\$23,200,000
Plant molecular farming	\$22,000,000
Fermentation (multiple)	\$5,500,000
Plant-based, Cultivated, Fermentation, & Plant molecular farming	\$492,000
<b>Total</b>	<b>\$1,530,417,000</b>

\*\*Traditional Fermentation, Cultivated & Fermentation, Cultivated & Plant molecular farming, Plant-based & Plant molecular farming, and Fermentation & Plant molecular farming companies reported no figures



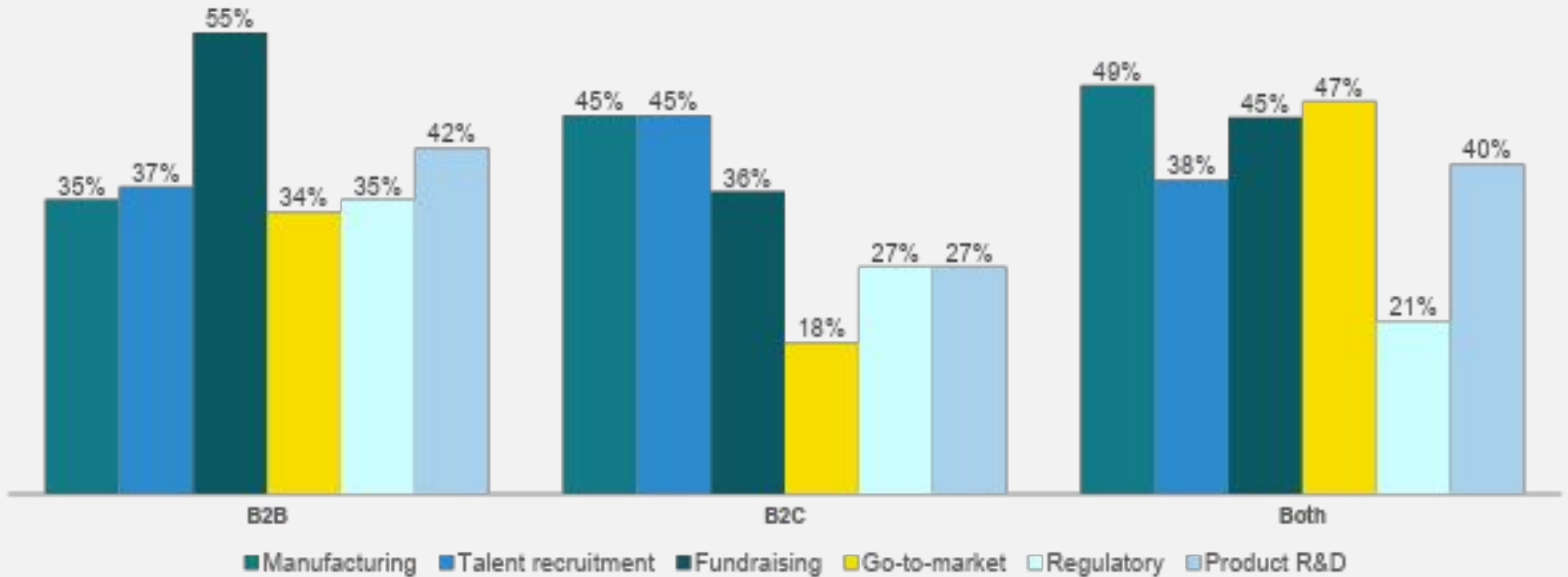
# Fundraising – future 12-month goals

Alternative protein category	Pre-seed	Seed	Series A	Series B	Series C	Series D	Series E or later	PIPE	Public investment second offering	Debt (general)	Equipment financing	Project financing	Other specialty financing	Other	Total
Cultivated	\$4,220,000	\$43,850,000	\$111,500,000	\$170,100,000	\$450,000,000				\$100,000	\$100,000				\$20,000	\$779,890,000
Plant based	\$5,185,000	\$18,900,000	\$94,025,000	\$15,000,000	\$15,000,000				\$300,000		\$2,200,000	\$1,600,000		\$1,000,000	\$153,210,000
Plant-based & Fermentation	\$2,850,000	\$2,500,000	\$45,200,000		\$100,000,000						\$1,000,000	\$500,000			\$152,050,000
Biomass Fermentation	\$4,000,000	\$12,000,000	\$21,500,000	\$100,000,000						\$5,000,000	\$2,000,000			\$100,000	\$144,600,000
Precision Fermentation	\$3,800,000	\$3,000,000	\$30,000,000	\$100,000,000											\$136,800,000
Plant based & Cultivated	\$675,000	\$4,500,000	\$20,000,000	\$34,000,000											\$59,175,000
Other	\$3,500,000		\$45,000,000											\$5,000,000	\$53,500,000
Plant-based, Cultivated, & Fermentation	\$700,000	\$2,500,000					\$20,000,000								\$23,200,000
Plant molecular farming	\$2,000,000				\$20,000,000										\$22,000,000
Fermentation (multiple)		\$5,000,000									\$500,000				\$5,500,000
Plant-based, Cultivated, Fermentation, & Plant molecular farming	\$150,000	\$50,000	\$25,000	\$50,000	\$5,000	\$150,000				\$20,000	\$30,000	\$10,000	\$2,000		\$492,000
<b>Total</b>	<b>\$27,080,000</b>	<b>\$92,300,000</b>	<b>\$367,250,000</b>	<b>\$419,150,000</b>	<b>\$585,005,000</b>	<b>\$150,000</b>	<b>\$20,000,000</b>		<b>\$400,000</b>	<b>\$5,120,000</b>	<b>\$5,730,000</b>	<b>\$2,110,000</b>	<b>\$2,000</b>	<b>\$6,120,000</b>	<b>\$1,530,417,000</b>

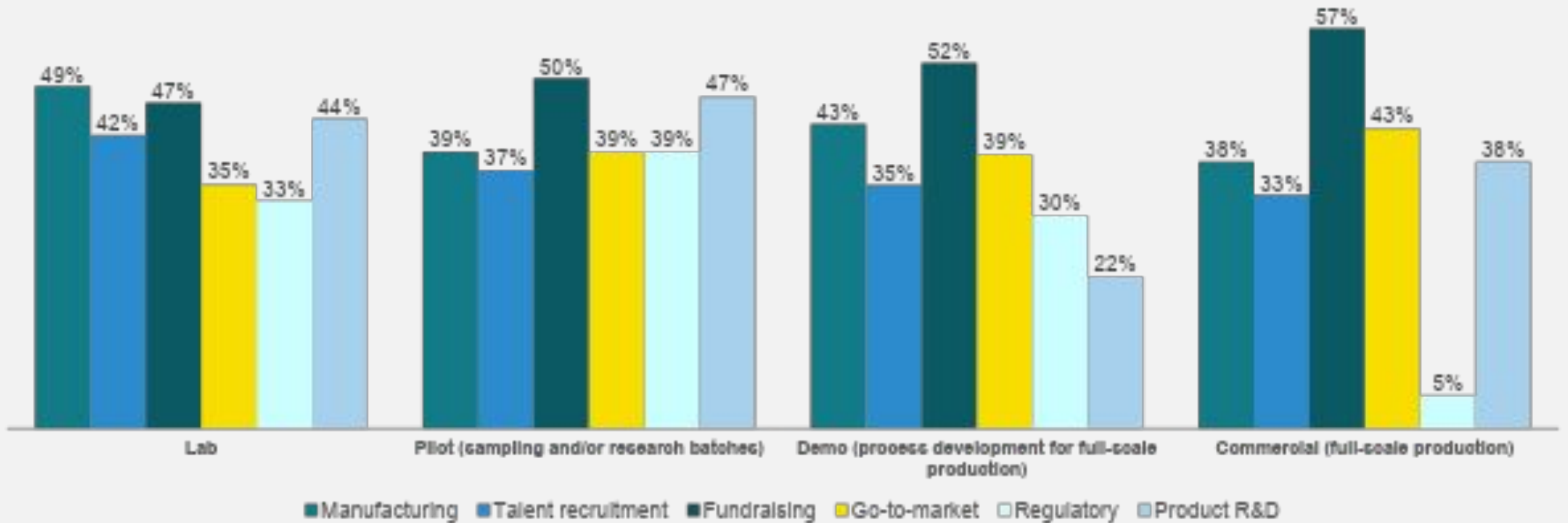
\*\*Traditional Fermentation, Cultivated & Fermentation, Cultivated & Plant molecular farming, Plant-based & Plant molecular farming, and Fermentation & Plant molecular farming companies reported no figures



# Biggest challenge – business model



# Biggest challenge – production stage





# Biggest challenge – dollars fundraised

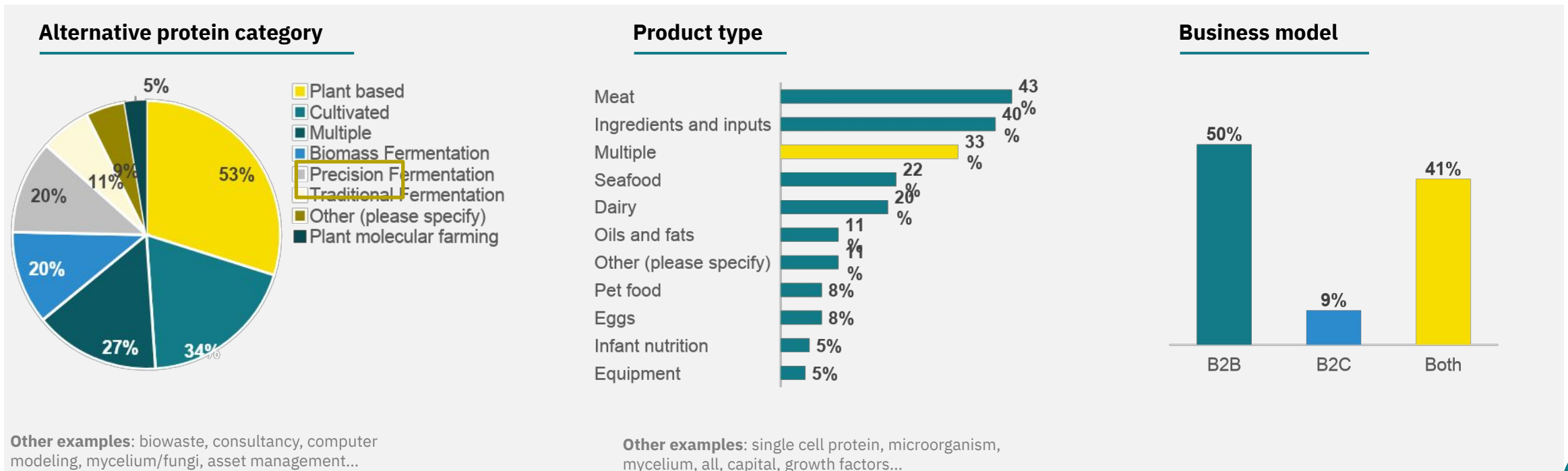


# Talent + Workforce Development

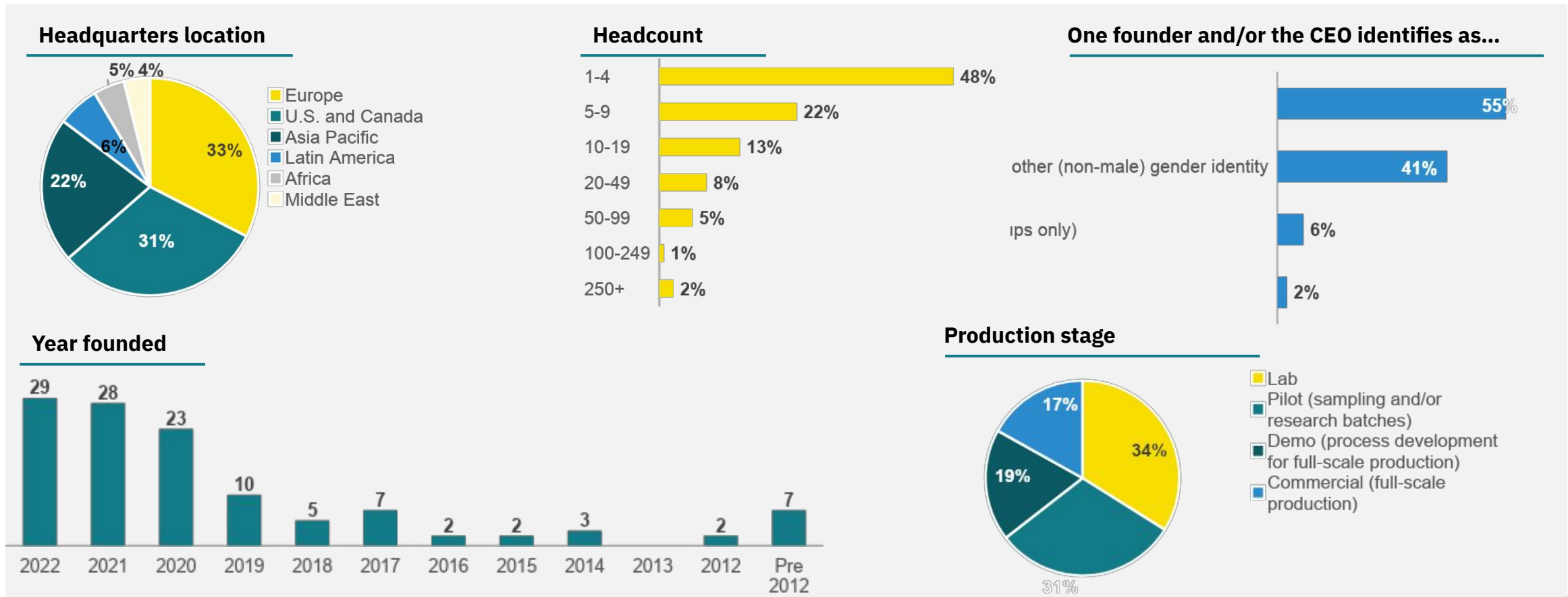


# Talent & workforce participant overview

**Responses:** 130 participants in total responded to at least one question in the talent & workforce section

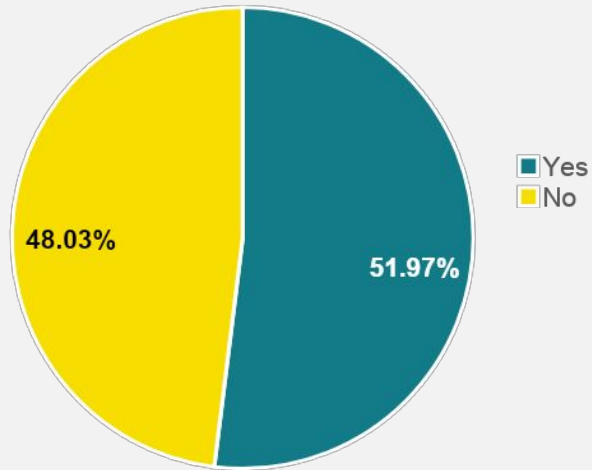


# Talent & workforce participant overview cont.



# Talent and workforce – barriers to hiring

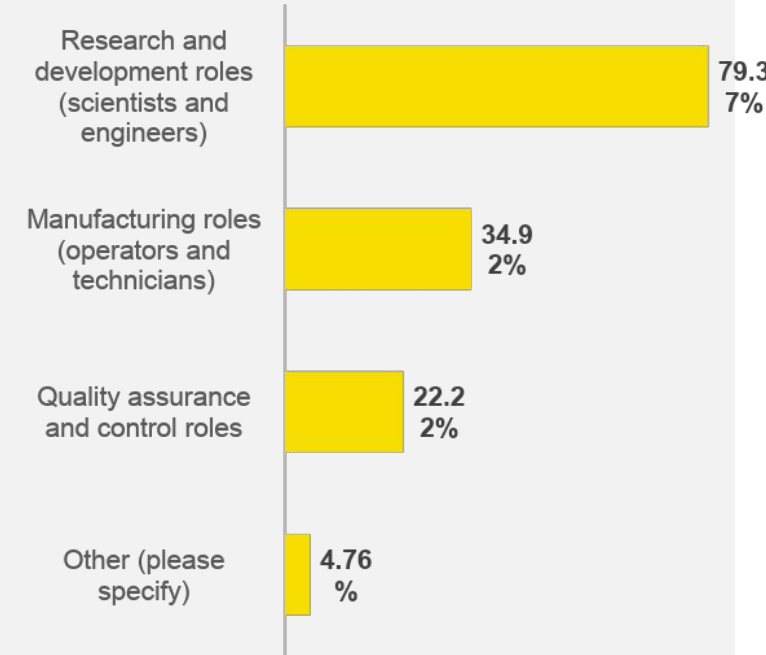
## Difficulty hiring technical talent



## Severity of talent bottleneck

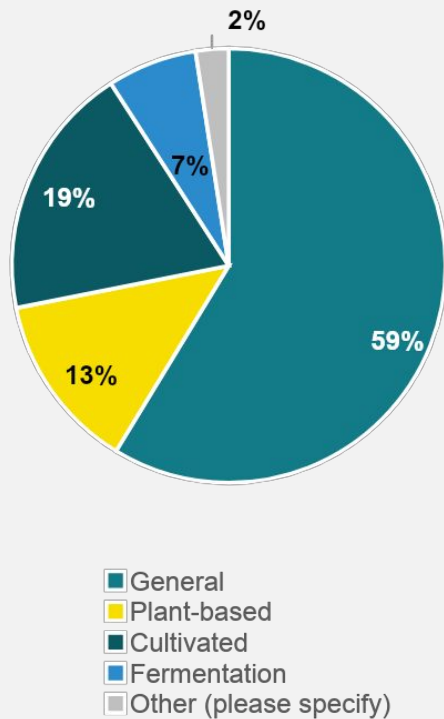


## Challenging technical roles to hire

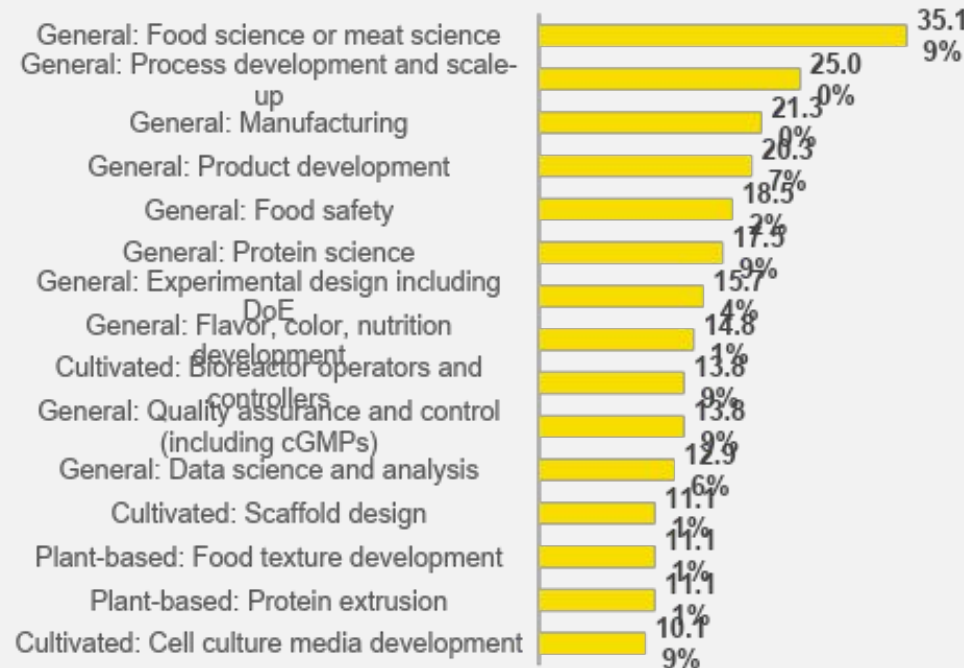


# Talent and workforce – current missing talent

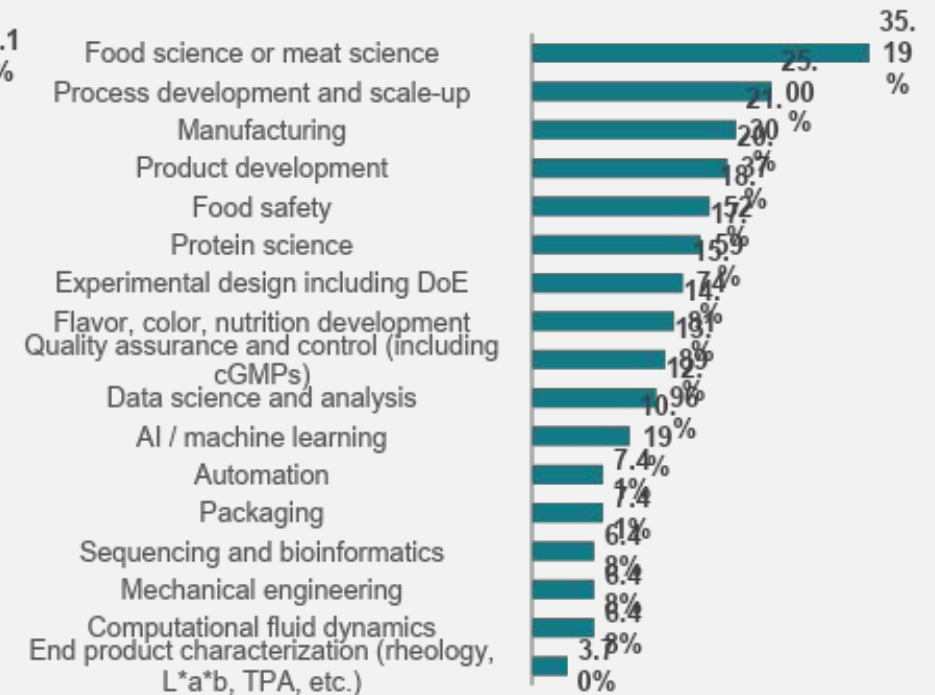
Technical skills missing today



Top 15 overall skills missing

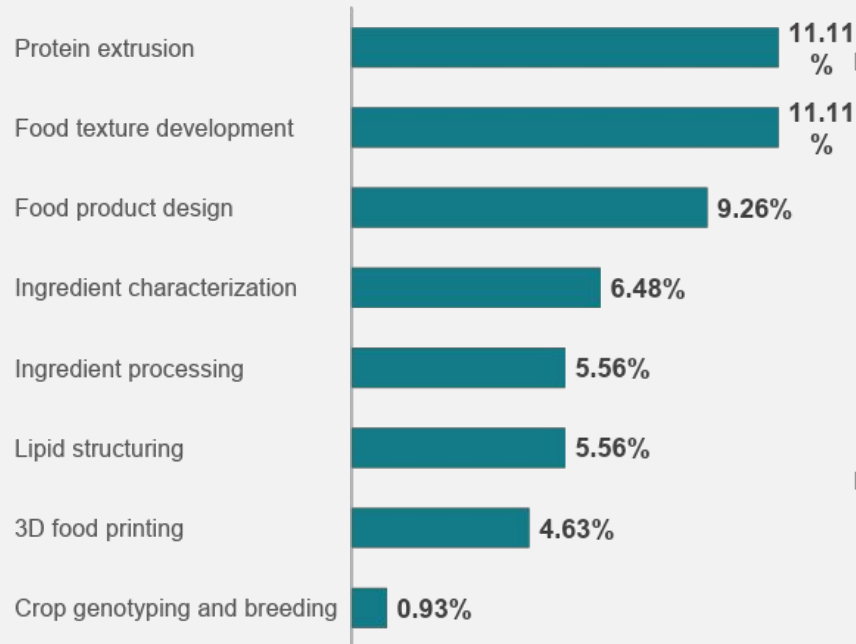


General skills missing

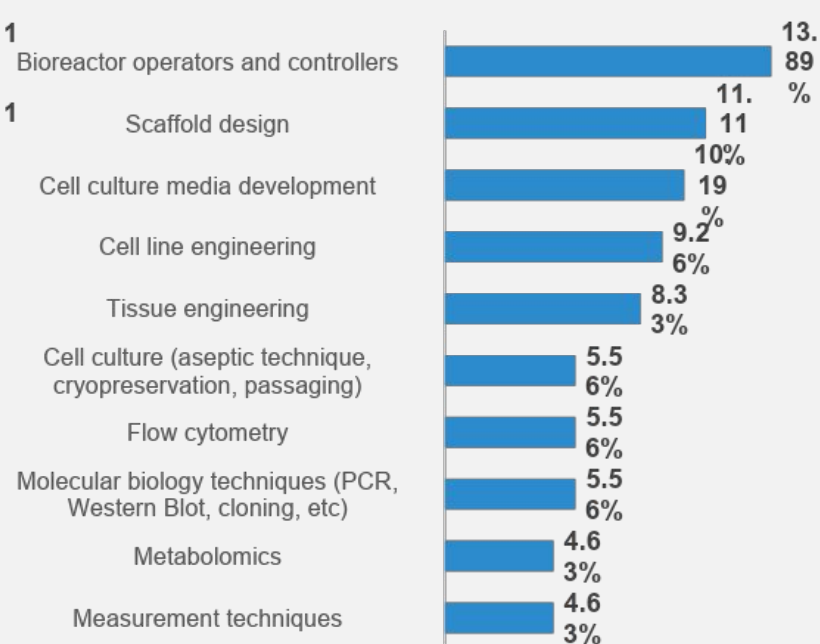


# Talent and workforce – current missing talent

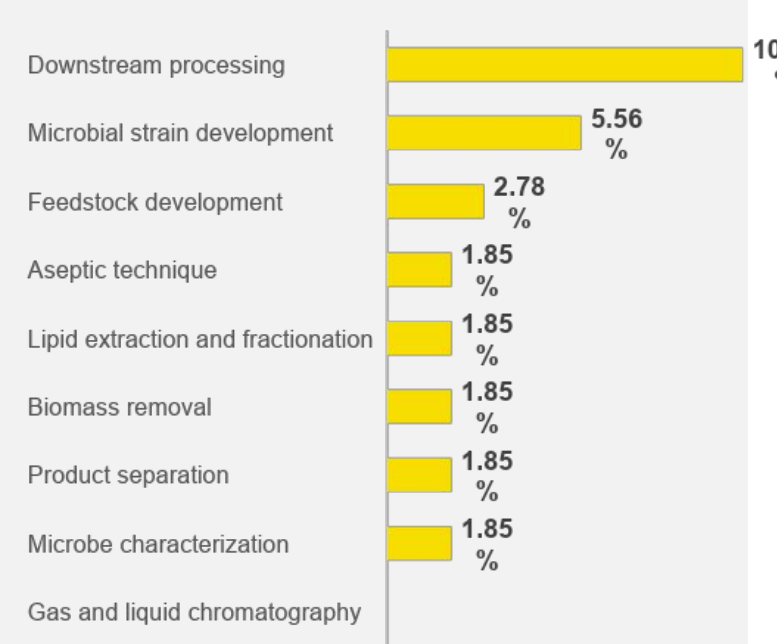
## Plant-based skills missing



## Cultivated skills missing



## Fermentation skills missing



# Talent and workforce – current missing talent

Plant-based		Cultivated	
Skill or background	% respondents	Skill or background	% respondents
General: Food science or meat science	40%	Cultivated: Bioreactor operators and controllers	38%
General: Process development and scale-up	28%	General: Food science or meat science	32%
General: Protein science	22%	Cultivated: Scaffold design	30%
General: Product development	21%	Cultivated: Cell culture media development	30%
Plant-based: Protein extrusion	21%	Cultivated: Cell line engineering	27%
General: Manufacturing	19%	Cultivated: Tissue engineering	24%
Plant-based: Food texture development	19%	General: Process development and scale-up	22%
General: Quality assurance and control (including cGMPs)	17%	General: Manufacturing	22%
General: Food safety	14%	General: Experimental design including DoE	22%
General: Data science and analysis	14%	General: Food safety	19%

Traditional Fermentation		Biomass Fermentation	
Skill or background	% respondents	Skill or background	% respondents
General: Food science or meat science	42%	General: Food science or meat science	45%
General: Process development and scale-up	42%	General: Process development and scale-up	41%
General: Manufacturing	42%	General: Manufacturing	41%
General: Food safety	25%	General: Food safety	27%
General: Data science and analysis	25%	Fermentation: Downstream processing	27%
General: AI / machine learning	25%	General: Quality assurance and control (including cGMPs)	27%
General: Automation	25%	General: Data science and analysis	18%
General: Experimental design including DoE	17%	General: AI / machine learning	18%
General: Product development	17%	General: Automation	14%
General: Flavor, color, nutrition development	17%	General: Experimental design including DoE	14%



# Talent and workforce – current missing talent

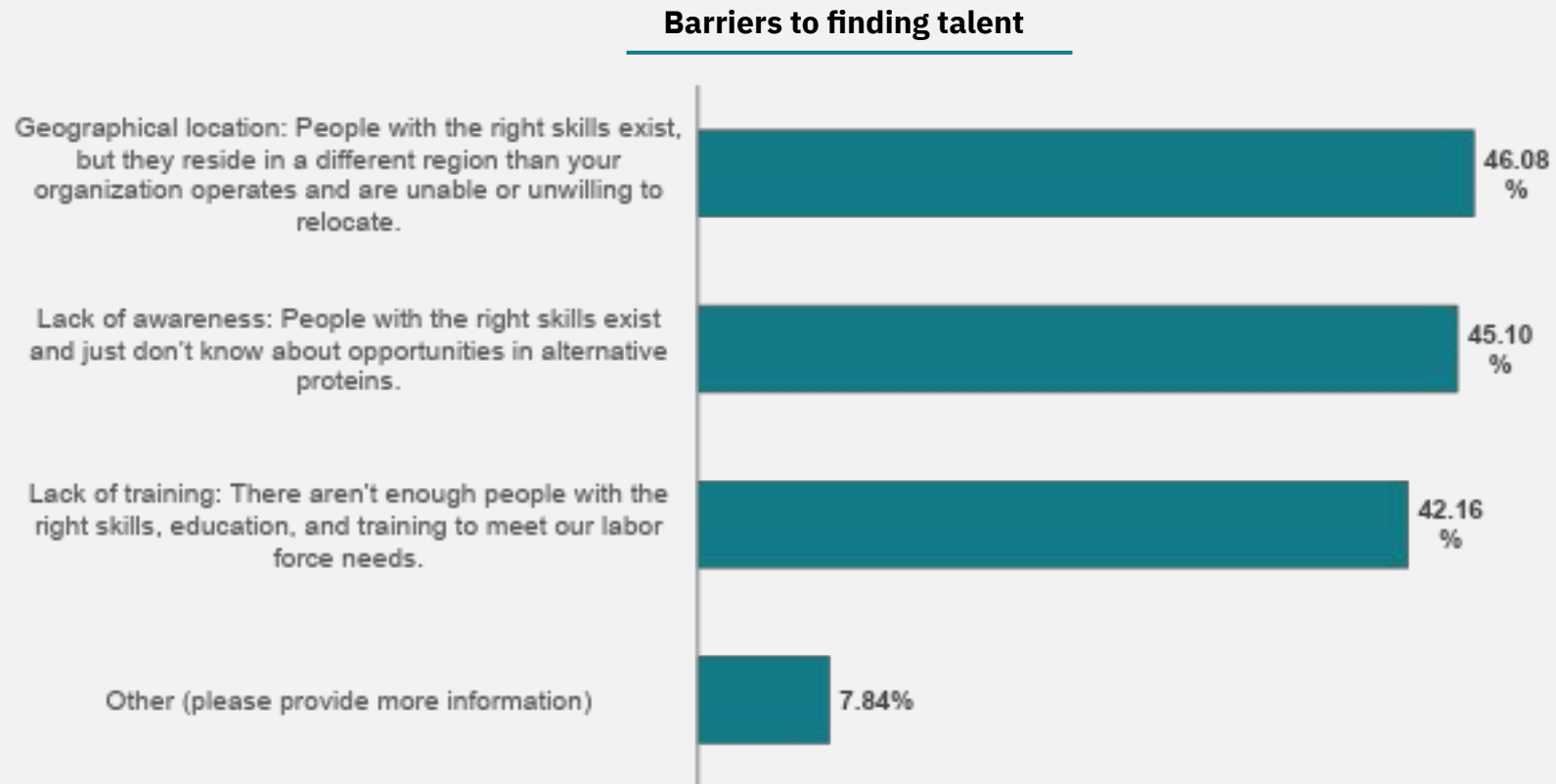
Precision Fermentation	
Skill or background	% respondents
General: Process development and scale-up	36%
Fermentation: Downstream processing	32%
General: Food science or meat science	27%
General: Quality assurance and control (including cGMPs)	27%
General: Manufacturing	23%
General: AI / machine learning	23%
Fermentation: Microbial strain development	23%
General: Food safety	18%
General: Protein science	18%
General: Data science and analysis	14%

Multiple	
Skill or background	% respondents
General: Food science or meat science	37%
General: Process development and scale-up	37%
General: Manufacturing	33%
Fermentation: Downstream processing	23%
General: Food safety	20%
General: Quality assurance and control (including cGMPs)	20%
General: Flavor, color, nutrition development	20%
General: AI / machine learning	20%
Plant-based: Protein extrusion	20%
General: Protein science	17%

Plant molecular farming	
Skill or background	% respondents
General: Food science or meat science	50%
General: Process development and scale-up	33%
General: Manufacturing	33%
General: Food safety	33%
General: Protein science	33%
Plant-based: Food product design	33%
General: Quality assurance and control (including cGMPs)	17%
General: Flavor, color, nutrition development	17%
General: End product characterization (rheology, L*a*b, TPA, etc.)	17%
General: Product development	17%

Other (please specify)	
Skill or background	% respondents
General: Manufacturing	38%
General: Food safety	38%
General: Data science and analysis	38%
General: Quality assurance and control (including cGMPs)	25%
General: AI / machine learning	25%
Other (please specify)	25%
General: Experimental design including DoE	25%
General: Process development and scale-up	13%
Fermentation: Downstream processing	13%
General: Protein science	13%

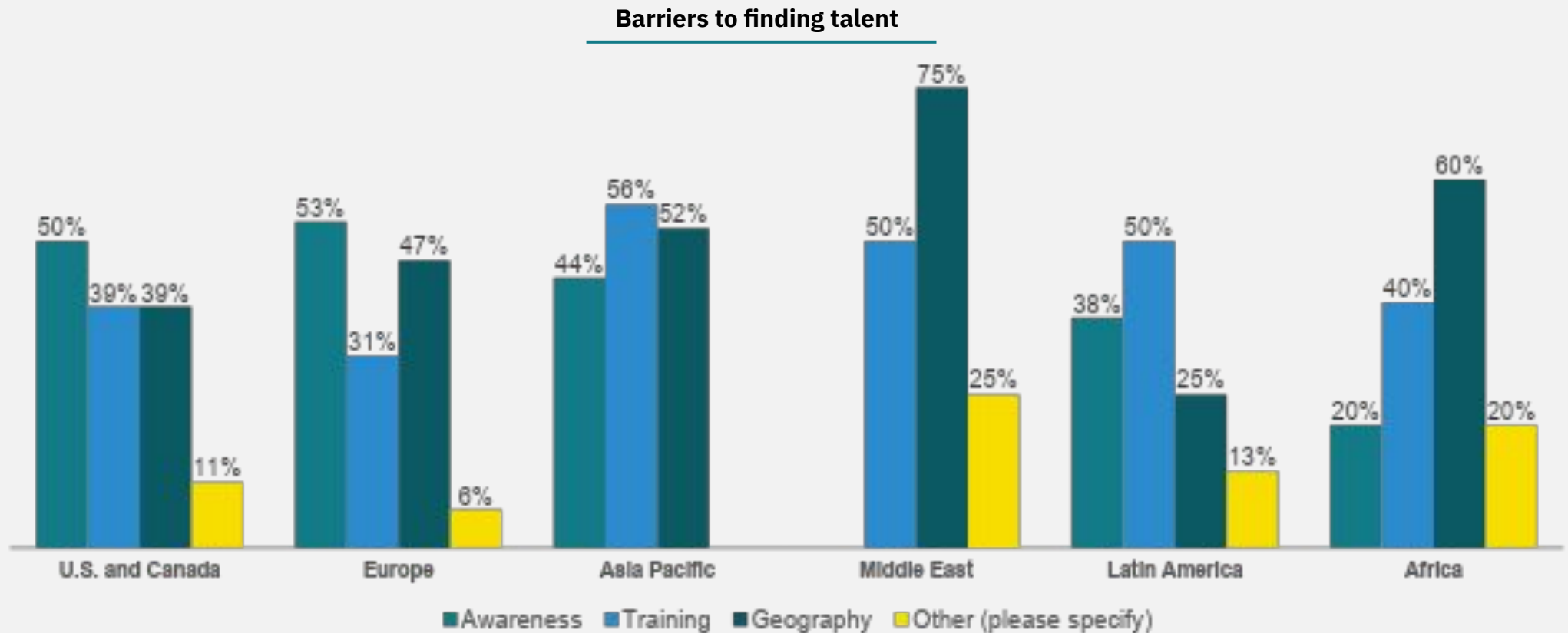
# Talent and workforce – barriers to finding talent



Other examples: funding, locating specific talent, organizational structure



# Talent and workforce – barriers to finding talent



# Talent and workforce – barriers to finding talent

Please provide more context on how geographical factors have posed challenges with respect to talent and hiring.	Tags
My country does not have this industry (Ukraine)	Industry and Business
companies are based in East and West coast where there are not many manufacturing capabilities available	Industry and Business
Non availability of ingredients	Industry and Business
A managerial role as a Chief Science Officer to lead the R&D and development of our alt protein products	Industry and Business
We're in an innovation hub yet our customers and business model is global... hard to get innovation-oriented employees outside of the hub.	Industry and Business
Brexit!	Misc.
I am in school still. People don't like longterm projects	Misc.
South Africa being a educationally starved country does not have many people aware of it.	Misc.
Training required	Misc.
no clear feed back from where we are operating	Misc.
We haven't yet experienced significant challenges with hiring. We have recently hired three technical cell line eng staff with a wide range of species experience.	Misc.
Not so many experienced trained staff available willing to to a perfect job	Misc.
very challenging, the traditions in meat and dairy foods are very strong.	Misc.
Pakistan is between Afghanistan & India, and...	N/A
Not	N/A
no	N/A
Not an issue we are a hybrid organization	N/A
non	N/A
they did not	N/A
Lack of scientists in Europe.	Relocation
In our case we may find the right talent not located in our city/town. The question occurs if the talent is willing to move to our city location	Relocation
Obviously young talented people want to live in urbanized locations / cities to manage their work-life balance best	Relocation
Company located in a middle-sized city and people are not very much willing to relocate.	Relocation
US to EU relocation is challenging	Relocation
Our company is located in Budapest/Hungary and it is not easy to get staff relocate to our country	Relocation
It is challenging to make talents move to the Czech Republic.	Relocation
We are in Africa and most talent with knowledge of cultivated meat is outside of Africa, having access to anyone that would travel here is difficult.	Relocation
We operate in the UK and Kenya and we find that there is more consolidation of talent in the US	Relocation
Limited talent pool in the country and relocation to the country is not a popular choice	Relocation
Singapore has a lack of biology talent as the pool is typically siphoned to A* Star	Relocation
We are located in the country's periphery, while naturally, most of the potential employees are situated in/near its center. Many of the talents we spoke with were unwilling to relocate to our region, while schlepping over is not a viable option.	Relocation
People don't want to move?	Relocation
It's very expensive	Relocation
Most people with the right skills live outside EU	Relocation
Major talent do not want to relocate to other than mega cities.	Relocation
Midwest is not a great place for recruiting talent	Relocation
We are in New Zealand. We don't have a large pool of appropriate talent because of limited opportunities in science generally, the country remains GMO free also.	Relocation
Mexico has great junior talent in tissue engineering and alike but lacking senior very experienced talent. Relocating highly qualified researchers from the US to Mexico is not easy.	Relocation
People need to move to Sweden	Relocation
Talent in this field prefer the coast.	Relocation
I live in a very small country and it's almost impossible to find the good talents to work in a start-up "for free". Of course people from close country are not willing to move and pay rent without having a job.	Relocation
South Africa is only just starting off in the cultivated meat industry, no trained food scientists, cell culture scientists with training or experience in the cultivated meat industry	Relocation
We are located in Southern Europe - low salaries	Salaries
high qualified talents dont want to realocate to a country where salaries are cinsiderable lower then others in europe	Salaries
Low salaries and relocation.	Salaries
Singapore requires high starting salaries and significant time investment in providing a visa (Employment pass) for foreigners	Salaries

# Talent and workforce – barriers to finding talent

**What are the skills, disciplines, and/or sectors we should target to generate more awareness about opportunities in alternative proteins?**

-Across universities where food scientists & food technologists are educated

-Across young employees working in the classical food industry that may not be satisfied with their job

We need biotech engineers but they never even considered a career in foodtech. Foodtech has to be made sexier i believe

QSR; street food, in FS institutions, public services...

The whole nine yards in Pakistan

Strategic advice on how to succeed in the market among high competition. Brand/product mgmt, consumer insight, governance.. SCALING UP

Pharmaceutical, Biotechnology and traditional fermentation companies

regulatory affairs

Push sustainability - do your bit for your planet. Work in sustainable proteins

Awareness of people with transferable skills to alternative proteins

Biotechnology and bioengineering domains

Biochem, physics, chem eng - bring Material Science people into alt-protein.

I think giving younger generations hope and identify that there are vast funding opportunities available in all fields of work related to alternative proteins is a key element to get more diverse backgrounds

Cultivated seafood

Look at tying up with chefs and ordinary consumers in India and Asia Pacific region. They can be the ones who have picked up the alternative proteins as a lifestyle choice and regularly cook with these food products. The Asian market is huge and the diet can shift towards using alternative proteins. This can open up the market and increase profits.

The opportunity for growth broadcast outside the media Read by the already interested

marketing

AI / Machine learning, data science

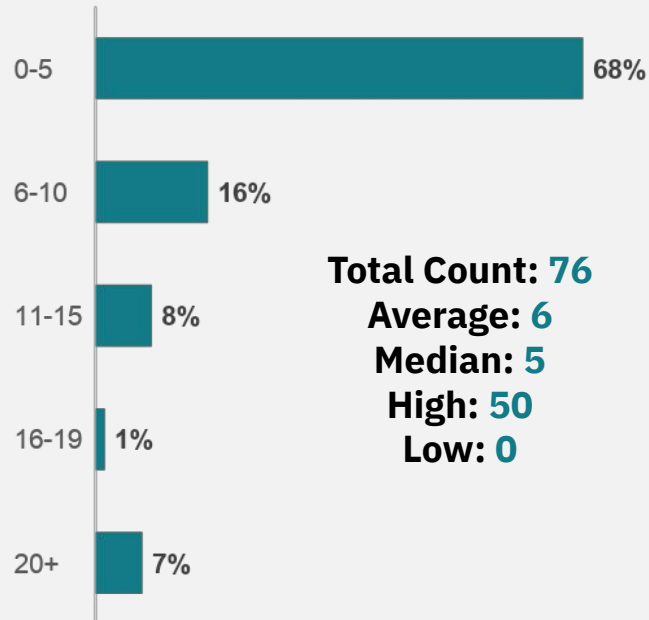


# Talent and workforce – barriers to finding talent

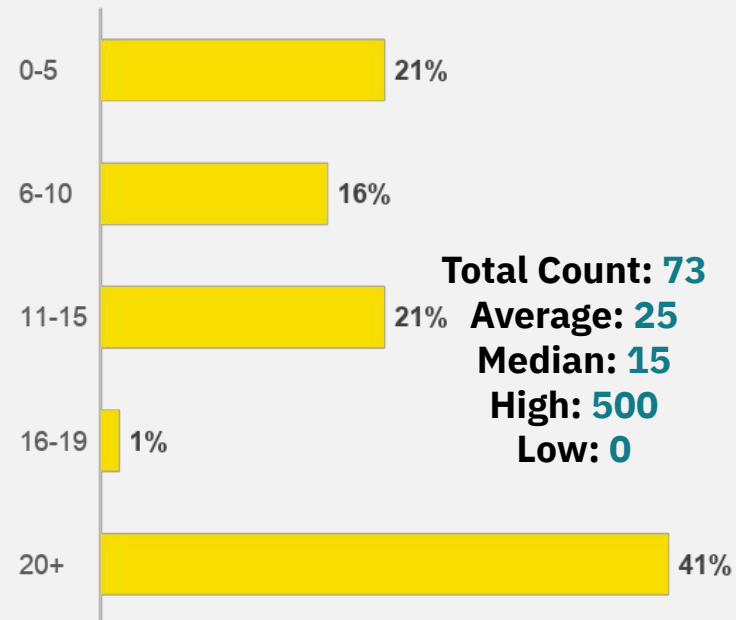
What types of skills, education, and training are missing from these existing talent streams?
Understanding the difference between the pharma and food industries and adaptability. There is a lack of the right attitude/adaptable mindset, thinking out of the box.
Scientific Methodologies development and once results are measured in scientific measurement equipment, understanding the results and implement adjustments.
biotech engineers
RND
there are no skills, education or training present in creating existing or future talent streams
Strategic
Lack of awareness and then scale up
business
markets
Bridge the gap from technical to sales
not sure yet
aquaculture
The cultivated meat industry is simply too young to be able to hire talents with previous experience.
Specialists in protein science and/or food industries
Academic institutions to foster skill development
Lots of chemical or mechanical engineers of all experience levels who care about sustainable technologies
Culture of additive contribution. Hard to find emerging and young talent that want to go beyond average performance. We're not asking or looking for people who want to grind, overwork, are toxic, etc. But it is hard to find positive urgency in a space that needs it more than ever.
Bioengineering and material sciences
not enough material science (proteins, starches, hydrocolloids, interactions between)
scaffold design for texture and taste
Marketing, plant biology, and product designers. We need to get people who can constantly play devil's advocate so that the network doesn't become a yes-man hype bubble.
Lack of general information
Industrial scale manufacturing of alternative protein food is non existent in India
No clarity on what kind of skills are going to be needed. Will it be professionals and students from pharma/food industry/bio-technology/chemical engineering or social sciences who will be needed in the industry once it grows, is unclear.
Practical and Hands-on exposure.
Biosynthetic knowledge
Lack of experience in Bio availability
Being able to merge technical knowledge and business/sales acumen
Technical experienced skills
usage of these type of proteins, mechanical and functional properties of these novel proteins
VC focus on Alt Proteins are few
product launches
Alternative protein product development

# Talent and workforce – future talent needs

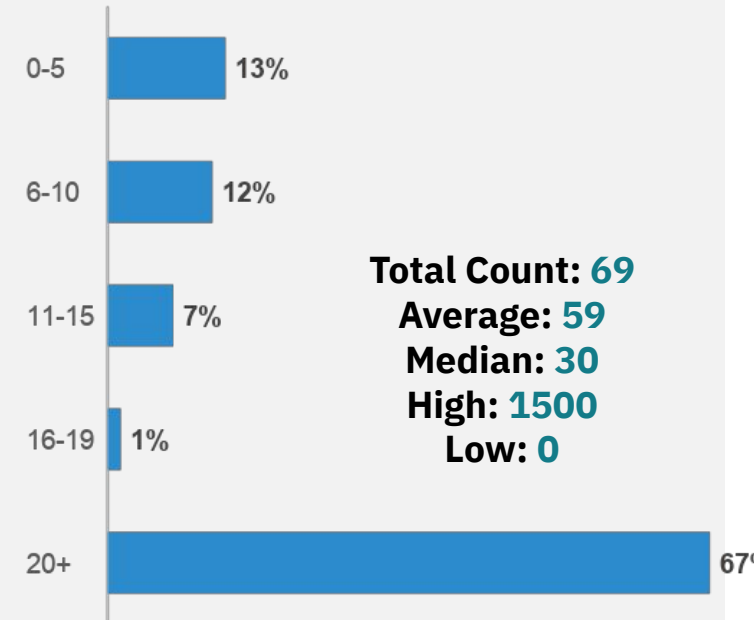
Technical hiring requirements – 1 year



Technical hiring requirements – 3 years

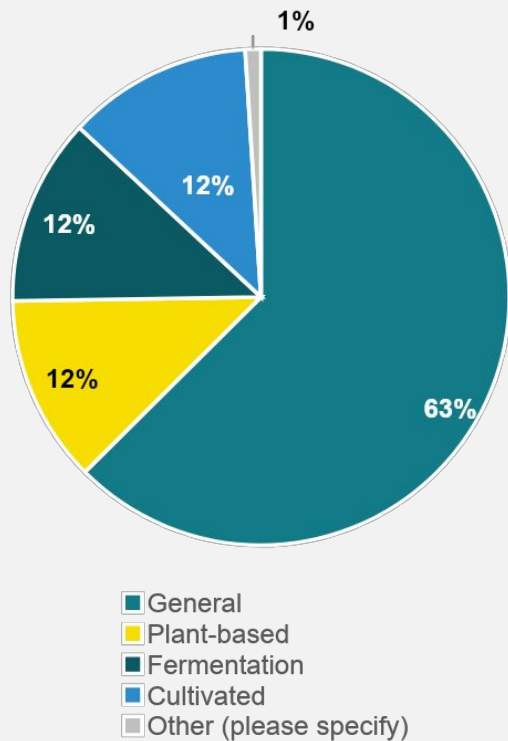


Technical hiring requirements – 5 years

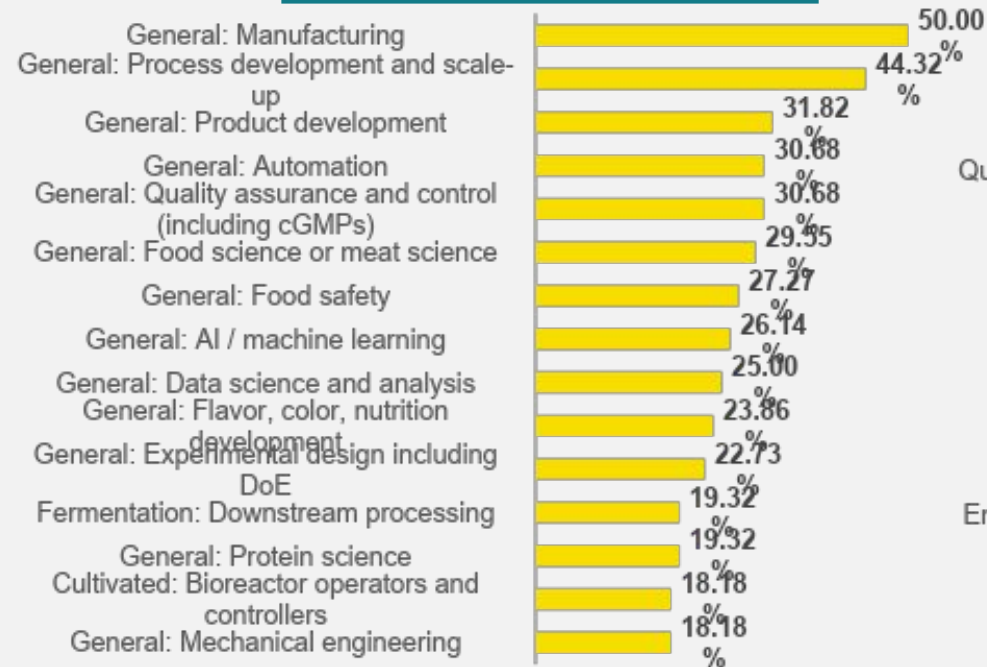


# Talent and workforce – future talent needs

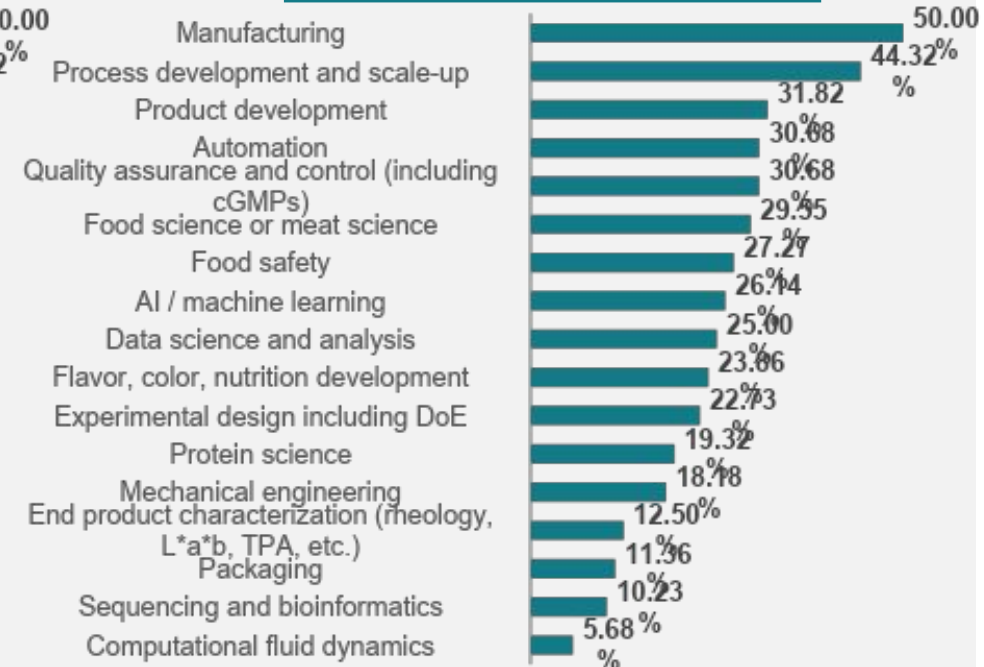
Technical skills needed in 5 years



Top 15 overall skills needed in 5 years



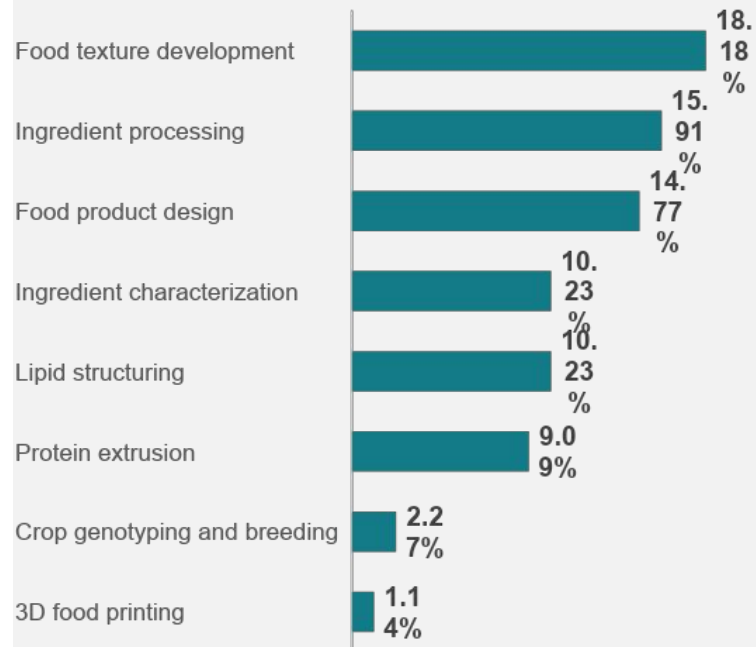
General skills needed in 5 years



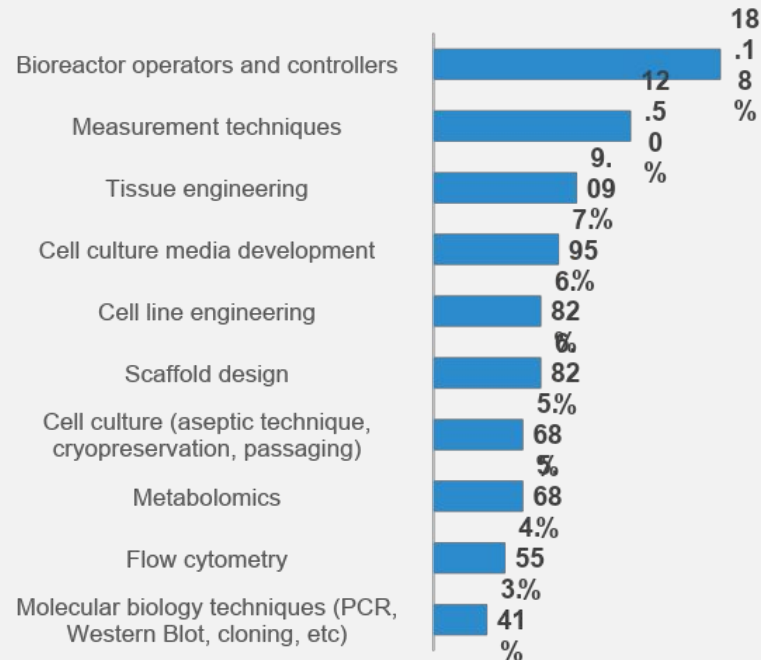


# Talent and workforce – future talent needs

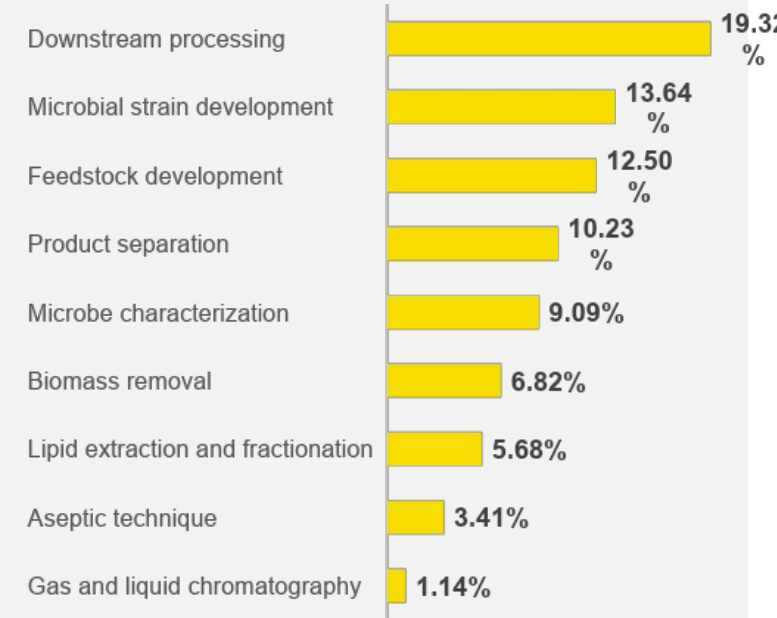
## Plant-based skills needed in 5 years



## Cultivated skills needed in 5 years



## Fermentation skills needed in 5 years



# Talent and workforce – future talent needs

Plant-based		Cultivated	
Skill or background	% respondents	Skill or background	% respondents
General: Manufacturing	51%	General: Manufacturing	46%
General: Process development and scale-up	40%	Cultivated: Bioreactor operators and controllers	37%
General: Food science or meat science	35%	General: Process development and scale-up	34%
Plant-based: Food texture development	33%	General: Product development	31%
General: Product development	30%	General: Quality assurance and control (including cGMPs)	31%
Plant-based: Food product design	30%	General: Food science or meat science	29%
General: Quality assurance and control (including cGMPs)	26%	General: Food safety	29%
General: Data science and analysis	26%	General: Automation	29%
Plant-based: Ingredient processing	26%	Cultivated: Measurement techniques	29%
General: AI / machine learning	23%	General: AI / machine learning	26%

Traditional Fermentation		Biomass Fermentation	
Skill or background	% respondents	Skill or background	% respondents
General: Manufacturing	73%	General: Manufacturing	65%
General: Food science or meat science	55%	Fermentation: Downstream processing	59%
Fermentation: Downstream processing	55%	General: Automation	59%
General: Process development and scale-up	45%	General: Process development and scale-up	47%
General: Product development	45%	General: AI / machine learning	47%
General: Quality assurance and control (including cGMPs)	36%	General: Food science or meat science	35%
General: Automation	36%	General: Product development	35%
General: Data science and analysis	27%	General: Quality assurance and control (including cGMPs)	35%
General: Experimental design including DoE	27%	General: Data science and analysis	35%
General: Mechanical engineering	27%	General: Flavor, color, nutrition development	29%

# Talent and workforce – future talent needs

Precision Fermentation	
Skill or background	% respondents
General: Process development and scale-up	59%
General: Manufacturing	53%
General: Data science and analysis	41%
Fermentation: Downstream processing	35%
General: Automation	35%
General: AI / machine learning	35%
General: Flavor, color, nutrition development	29%
Fermentation: Feedstock development	29%
Fermentation: Microbial strain development	29%
General: Experimental design including DoE	29%

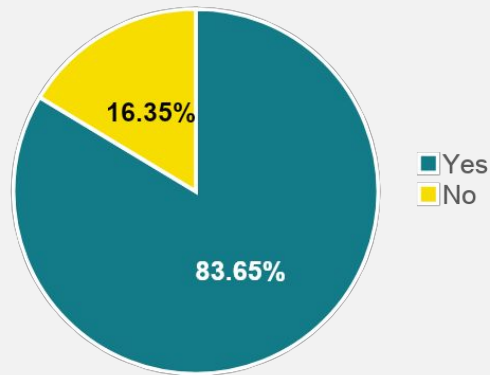
Plant molecular farming	
Skill or background	% respondents
General: Process development and scale-up	67%
General: Manufacturing	67%
General: Food science or meat science	67%
General: Automation	33%
General: Flavor, color, nutrition development	33%
General: Product development	33%
General: Sequencing and bioinformatics	33%
Cultivated: Flow cytometry	33%
General: Data science and analysis	0%
Fermentation: Downstream processing	0%

Multiple	
Skill or background	% respondents
General: Manufacturing	65%
General: Process development and scale-up	48%
General: Product development	39%
General: Food science or meat science	35%
Fermentation: Downstream processing	35%
General: AI / machine learning	30%
General: Automation	26%
General: Flavor, color, nutrition development	26%
General: Data science and analysis	26%
General: Experimental design including DoE	26%

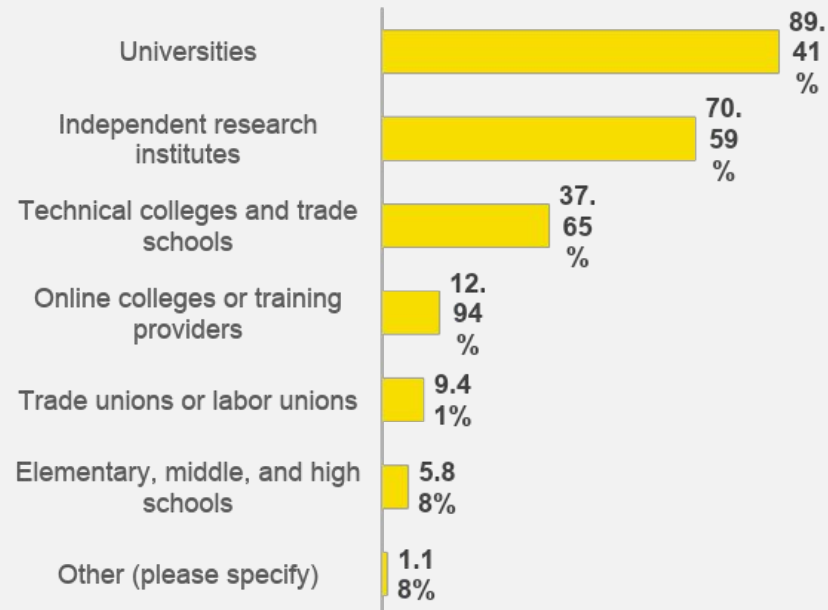
Other (please specify)	
Skill or background	% respondents
General: Process development and scale-up	67%
General: Manufacturing	56%
General: AI / machine learning	56%
General: Automation	44%
General: Product development	33%
General: Data science and analysis	33%
General: Quality assurance and control (including cGMPs)	33%
Fermentation: Downstream processing	22%
General: Experimental design including DoE	22%
General: Food safety	22%

# Talent and workforce – forming partnerships

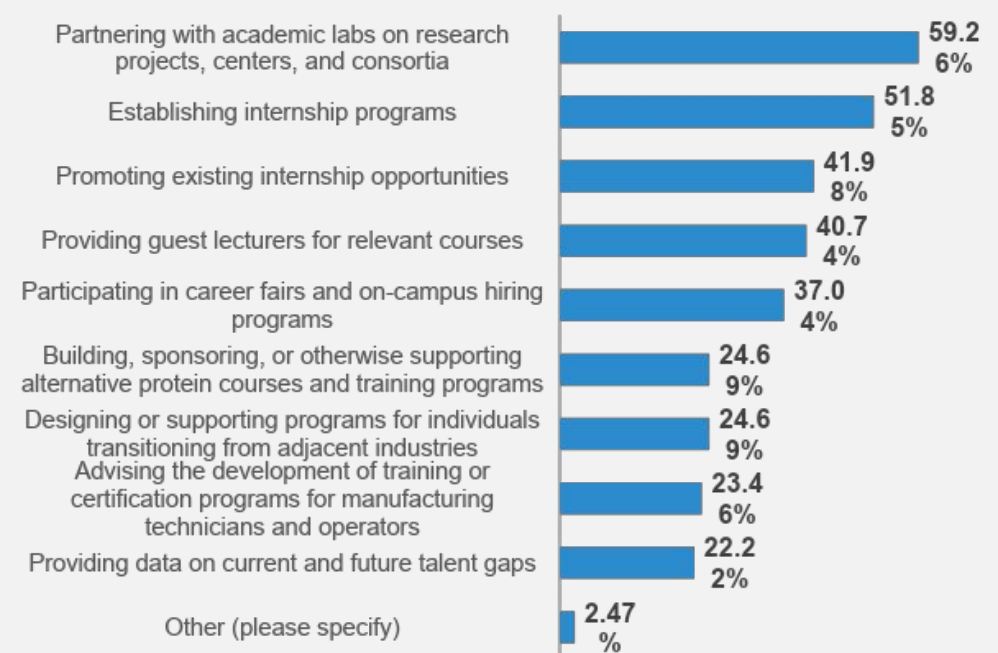
## Interest in partnering to bridge labor force gaps



## Institutions of interest for partnerships



## Ways of partnering



# Methodology notes



- Have companies list their company name in the survey to avoid duplicate responses from the same company
- Total fundraised \$'s and future fundraising goals in a multiple-choice selection (<\$100m, \$100-\$200m, etc. (someone could've easily missed a zero or added one too many, skewing the data)
- Provide definitions of alternative protein category options (ex: Plant-based = xyz, Biomass Fermentation = xyz, etc.)
- Limit # of total questions to improve response rates (potentially breakout into two surveys)
- Somehow work to get a representative sample of the industry by business size, stage, location, etc.? (easier said than done)